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ON GALL-STONES

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THE ETIOLOGY
SYMPTOMS, AND TREATMENT
OF
GALL-STONES

BY

DR. J. KRAUS, SEN.
OF CARLSBAD

WITH ADDITIONAL REMARKS ON OPERATIVE
TREATMENT BY

HENRY MORRIS, M.A., M.B. (LOND.), F.R.C.S.

SURGEON TO, AND LECTURER ON SURGERY AT, THE MIDDLESEX
HOSPITAL; MEMBER OF THE COUNCIL, AND OF THE COURT
OF EXAMINERS, OF THE ROYAL COLLEGE OF SURGEONS
(ENGLAND); EXAMINER IN SURGERY IN THE
UNIVERSITY OF LONDON

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P R E F A C E

THE favourable reception which my "*Beiträge zur Pathologie und Therapie de Gallensteinkrankheit*"—now in its second edition—has met with in Germany, has induced me to offer this translation to the medical profession in England.

The fact that many of my English friends have been kind enough to express the hope that such a translation would appear has been a further incentive to me to prepare this volume. With regard to operative treatment in these cases, I have been fortunate enough to obtain the views of an English authority, Mr. Henry Morris of the Middlesex Hospital, London, in addition to those of some of my own countrymen and other Continental writers, and I wish to take this opportunity of expressing my best thanks to Mr. Morris for his valuable contribution, as I feel sure that much thereby is added to the practical nature and utility of the book.

CARLSBAD, 1896.



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ON GALL-STONES

PART I

I

STATISTICS

SINCE my first publication¹ on the subject of gall-stones—now many years ago—I have had ample opportunity by further observations of confirming most of the views I then expressed; but some things I have found necessary to modify, and some to alter completely, and this is my reason for entering once more into a discussion of a disease so frequent in occurrence and so great in importance—especially for Carlsbad—as that of gall-stones undoubtedly is. The number of cases which came under my care between 1881 and 1889 amounted to over 1500, which is more than double the number of the ten previous years; such a comparatively large increase can only be explained by supposing a particularly large number to have fallen under my treatment.

¹ *Prager Med. Wochenschrift*, 1881. Nos. 10, 11, 12.

ON GALL-STONES

Below is a table of statistics of the cases of gall-stones which have come under my observation between the years 1881-1889 and also between 1871-1880.

BETWEEN AGES OF—

YEAR.	20-30.		30-40.		40-50.		50-60.		60-70.		70 & above		TOTALS.	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
1881	—	4	5	31	19	41	15	22	4	8	—	1	43	107
1882	—	6	8	32	23	43	18	21	5	9	2	0	56	111
1883	1	5	5	32	25	43	21	24	4	11	—	2	56	117
1884	—	8	4	29	21	38	20	26	6	9	—	1	51	111
1885	2	9	7	30	23	39	18	31	4	7	1	3	55	119
1886	2	11	6	32	28	42	16	26	2	5	—	5	54	121
1887	—	3	6	34	25	46	14	24	2	5	—	2	47	114
1888	1	4	5	38	29	48	16	29	1	6	2	1	54	126
1889	—	9	9	41	28	48	15	34	4	9	—	—	56	141
'71-'80	9	39	55	145	100	177	78	66	20	18	1	2	263	467
TOTAL '71-'89	15	94	110	444	321	565	231	303	52	87	6	17	735	1534

1. From the above table it will be seen that females suffer from gall-stones greatly out of proportion to males, the proportion being about—

5 to 2 between 1881 and 1889,

5 to 3 between 1871 and 1880;

which makes the average between 1871 and 1889 two females to one male.

2. With regard to the female sex the majority of cases occur between the ages of 30 and 50; whilst in the male sex more than 80 per cent. occur between the 30th and 60th years.

3. Taking all my cases together, the proportion suffering from gall-stones has increased from 12 per cent. to 18·20 per cent. within the last nine years.

The value of such statistics must necessarily be regarded as doubtful, especially with regard to the proportion of gall-stones to other maladies, so that no very definite conclusions can be drawn from them. We physicians at Carlsbad are necessarily to a certain extent specialists, inasmuch as we only meet with a limited variety of morbid conditions; and Carlsbad may be rather called a great hospital for those suffering with gall-stones than even for those affected with diabetes.

In a report of the Carlsbad hospital for foreigners for 1887, published by Dr. A. Herman,¹ the following facts will be found: Out of 189 patients treated there in 1887, 41 were cases of cholelithiasis, *i.e.*, above 22 per cent. of the total number, and the proportion of female (27) to male cases (14) is 2 to 1; so that these numbers agree very well with my own.

¹ *Prager Medic. Wochenschrift*, 1887. No. 48.

Abeles¹ states, from his own experience, that the proportion of those suffering from gall-stones to those suffering from other diseases is at Carlsbad as 1 to 7, viz., 14 per cent., and even then considers (and with good reason) that this estimate is too low. Generally speaking, all authorities agree that cholelithiasis is more prevalent in the female sex than in the male, but most English and French physicians think the general percentage higher (4 to 1) than the Germans.

The proportions obtained from the post-mortem records of large hospitals vary from 6 per cent. to 9 per cent., thus on the whole agreeing pretty well; but still they cannot be considered in any way decisive from a statistical point of view when we consider that it is only a certain class of people, viz., the poorer one, that frequents the hospitals, and gall-stones occur more rarely in the poorer classes; moreover, post-mortem discovery of gall-stones generally depends on mere chance, and as a rule occurs in persons of advanced age. That the opportunities of treating cases of gall-stones in hospitals are not common is well known to every physician who has had experience in hospital practice, and this fact is proved beyond all doubt by the annual reports of hospitals. In the Public Hospital of Prague, 36,065 in-patients were

¹ *Wicner Klin. Wochenschrift*, 1889. No. 2.

treated during the years 1880, 1881, 1882, and out of these there were only 46 cases of gall-stones (24 women and 12 men), which indeed is a strikingly small percentage. In the Vienna Public Hospital out of 51,960 in-patients during the years 1881–1884, there were only 36 cases of gall-stones (25 women and 11 men), which is much less than 1 per cent. Undoubtedly out of these 88,000 patients there may have been really many more with gall-stones; but only 82 have been taken into the hospital, **because they were suffering from gall-stones.**

M. Roth¹ has found in 2028 post-mortems (of which infants ought to be excluded) 166 cases of gall-stones, which amounts to about 8 per cent. Schröder has stated that out of all the post-mortem records in the Strassburg Infirmary (from 1880 to 1887), which came to 1150 in number, there are 141 cases of cholelithiasis, *i.e.*, 12 per cent.; the proportion of men to women being 1 to 4.

Fiedler² found 270 cases of gall-stones in 4300 post-mortems. By a careful review of a very large number of post-mortem records I have obtained very nearly the same results. Nearly all authors also agree

¹ M. Roth, *Beobacht. über d. Gallensteinkrankheit. Correspondenz-Blatt für Schweizer Ärzte*, 1881. No. 16.

² Fiedler, *Jahresbericht d. Gesellschaft f. Nat. u. Heilk. Dresd.*, 1879.

that, although gall-stones may occur in persons of any age, still they are practically very rare exceptions in children, and only slightly less rare in adults under 20. During twenty-five years of medical experience in Carlsbad, with over 2800 cases of gall-stones, I had not met with a single case in any one under 20 years old. This makes it all the more peculiar as I saw five cases in persons under 20 years old in the season of 1890.¹ Four of these were young ladies aged 17, 18 (two), and 19, and the fifth was a naval cadet of 17. There was also a sixth in a young lady of 21, but who, from the history of her case, had evidently suffered from gall-stones since she was 18. Without going further into these cases, I may add that I believe we have here something more than mere chance, and that the above cases are worthy of close attention.

¹ *Prager Medic. Wochenschrift*, 1891. No. 11.

II

ON THE MORPHOLOGY OF GALL-STONES

GALL-STONES consist of solid ingredients derived from the bile, or of products of its decomposition and combination, to which is frequently added mucus secreted from the gall-bladder. Consequently we find some stones which consist simply of cholesterin, and others of cholesterin, bile pigment, its derivatives and mucus. Calcium carbonate and calcium phosphate are also fairly often found among the ingredients in varying quantities, and also some fatty acids partly in the free state and partly combined with organic matters and calcium salts. In dealing with the structure, simple homogeneous stones must be distinguished from those which have a central nucleus round which other substances have collected. The homogeneous ones are made up of a substance of an earthy or soapy nature, and are, on the whole, not so common as the nucleated ones, which consist of a nucleus with one or possibly two coats outside it. The nucleus is either centrally or excentrically placed, in some cases

solid, and in others decomposed and crumbled away, and is usually composed of bile pigment and epithelium from the mucous membrane. Sometimes foreign bodies have been found to form the nucleus, and now and then a stone may have several nuclei which have either the qualities of those mentioned above, or each nucleus may consist of an independent gall-stone.¹

The outer layers of the stone which surround the nucleus have on section a streaked appearance sometimes, and at other times are arranged in strata, or a combination of both appearances may occur; and lastly, the layers may have no definite structure at all. In many concretions an outer cortical layer, the crust, can be distinguished, which is quite marked off from the main body of the stone which it invests either partially or completely according to the locality in which it has been formed. If the crust has been formed in the gall-bladder, it will be fairly equal in thickness, and will surround the whole stone, and in such cases is usually of dark colour, hard, and has a polished appearance. On the other hand, if the crust is formed while the stone is impacted in a duct, it will only form on those parts which come into contact

¹ Case published by me in *Prag. Med. Wochenschrift*, 1884. No. 49.

with the bile, and so will only partially surround the stone. In these cases the crust is soft, and inclined to crumble.

Excrescences are sometimes formed on the stones by substances becoming precipitated from the bile; they are of various sizes, and may be blunt or pointed, but are of importance on account of the difficulty they give rise to when the stone is passing through the duct, causing irritation and even ulceration of the duct walls. These excrescences may be few in number and "wartlike" in appearance; or they may be numerous, and equally distributed all over the stone, giving it a mulberry appearance.

The shapes of gall-stones are various. We may fairly presume *a priori* that every gall-stone has originally a rounded shape, and that that shape continues until influenced by surrounding conditions. If there is only one stone in the bladder, it will be fairly round or spherical until it has reached a certain size, after which it will become more oblong, tending to get a shape corresponding to that of the gall-bladder. If two or three stones are present, their shapes, though always recognisable, will at once be modified by the friction which takes place between them, as well as by the pressure of the contracting gall-bladder. The more stones there are the more

the spherical shape tends to pass into a polyhedral one, until finally they become figures with sharply defined margins of crystalline shapes such as tetrahedra, octahedra, simple and double four-sided pyramids, &c. In such stones cholesterin is usually the chief ingredient, but now and then I have seen varieties distinguished in many ways from those above described, viz.:—

1. Stones with holes in them, not much larger than peas, very hard and of dark-brown colour; and of such stones I have found in one case one, and three in each of two other cases. They consisted of chalk, phosphates, and bile pigment.

2. Stones about the size of beans, blackish colour externally, and of yellow ochre colour internally. They have no nucleus, but are made up of an earthy substance, and in their configuration resemble figures formed by children out of loam or bread crumbs. As soon as these stones, which are chiefly made up of bile pigments, get dry, they shrivel up and will fall to pieces at the slightest touch.

3. In one case I noted a great many blackish-green concretions which passed off in the course of a few weeks, which were about the size and shape of a raisin or small dried plum. They were exceedingly hard, and consisted of a collection of thickened bile,

strawberry-like grains, mucus, and a small amount of faecal matter.

I may also mention the conglomerations of gall-stones, which, however, occur very seldom, and were found only in post-mortem examinations (Frerichs). I have seen one such conglomeration (still in the gall-bladder) many years ago in the museum of pathology of the Dresden General Hospital. In 1890 I myself saw such a conglomeration of the size and shape of a pear, which was evacuated during life by a lady 60 years old, and I have carefully referred to this case in the Society of German Physicians at Prague.¹

7 The size of gall-stones varies from that of a grain to that of a walnut. It is true that even much larger ones do occur, but only as rare exceptions. The largest stone I have found myself and have preserved in my collection is the size of a dove's egg. The largest one I ever saw is that described by Fiedler;² it weighs 46 grammes, and consists of three pieces articulated by joint-surfaces at least 12 inches long, and gives a complete cast of the enlarged gall-bladder. This particular case was that of a lady who was frequently treated by me at Carlsbad, and was very interesting in many ways. ✓

¹ See Case xiii.

² Fiedler, *l. c.*

As a matter of fact, small stones are much more common than large ones; and if a good many stones are in the gall-bladder, their number, of course, influences their size and shape. ⁵ Some idea may often be formed as to the number of stones present by the shape of those voided. ⁶ If a stone of spherical or oblong shape is evacuated, it is probable that no others are present in the gall-bladder. ⁷ But if smaller faceted stones are evacuated, the number of facets gives some clue to the number of stones; but that does not necessarily prevent several large stones being present at the same time, either in the bladder or possibly in the larger ducts—a condition which I have often seen from post-mortem records. The natural attempts of the bladder, aided by other forces, are usually sufficient to get rid of the stones while these are still small, and that is the reason why larger stones do not more often occur.

The smallest variety of biliary concretions is the biliary gravel or sand. If this term is to be correctly used, it ought only to refer to deposits of the finest grains or powder which are sometimes found in the gall-ducts, and often abundantly in evacuations, and are said, according to Frerichs, ¹ to consist of bile pigments, bile resins, and cholesterin. ² At post-mortem

examinations gall-sand is often found in the smaller ducts, which it may block, and if in larger quantities, will be found in the larger ducts and the gall-bladder also. From clinical observations as well as from post-mortem records, it is stated that gall-sand may occur either with or without larger concretions. In some cases there is so much sand evacuated, that there is some difficulty in explaining its formation in such large quantities. I remember treating two ladies—mother and daughter—for several years, who both evacuated enormous quantities of gall-sand. This evacuation in the case of the mother was sometimes preceded by violent colic and vomiting, followed by transitory jaundice; whilst in the case of the daughter these symptoms were less marked. One may easily imagine that gall-sand, if in large quantities, will cause similar symptoms to those of a small stone by getting into the common bile-duct and blocking it, although for a short time only. In another case of an English lady, who had suffered from gall-stones for many years, and had been three times to Carlsbad for relief, large quantities of sand passed off with each evacuation, varying in quantity from a tea-spoonful to a table-spoonful. I have often observed in her case attacks of colic followed by a slight degree of jaundice, without ever finding any larger stone,

although it was carefully looked for. There were always the numerous evacuations of sand which caused the attacks of colic as well as the transitory obstruction of the common duct. The patient died at home presumably of exhaustion. At the post-mortem thick dark bile and biliary gravel were found in the bile-ducts, in the cystic duct was a stone as large as a walnut, and in the gall-bladder two others of nearly the same size.

Fauconneau Dufresne¹ mentions a case quoted by Charles Petit, of a man 65 years of age (treated at Vichy in 1844 and 1845), who, after suffering from gastro-duodenal catarrh, had frequent and very severe attacks of biliary colic followed by an abundant passage of gall-sand. "Il en rendit une quantité vraiment prodigieuse."

Murchison² quotes a case published by Dr. Handfield Jones (*Path. Trans.*, 5th vol. p. 150), of an icteric woman who died as a result of a broken leg, and at the post-mortem examination was found to have her common bile-duct blocked by a sandy mass consisting almost entirely of bile pigment.

¹ Fauconneau Dufresne, *Traité de l'Affectio Calcul. du Foi*, Paris, 1851, p. 283.

² Murchison, "Lectures on Diseases of the Liver," second edition, p. 337.

Naunyn¹ is treating the whole morphology of gall-stones in an exhaustive and lucid manner.

See also W. M. Ord ("The Influence of Colloids upon Crystalline Forms and Cohesion," London, Edward Stanford, 1879), and Thudichum ("Treatise on Gall-Stones").

¹ B. Naunyn, *Klinik d. Cholelithiasis*, Leipzig, 1892.

III

ETIOLOGY

THE causes which lead to the formation of gall-stone are partly direct and partly indirect, *i.e.*, predisposing causes. We must consider as direct causes all circumstances which lead to disturbances in the secretion or excretion of the bile, the stoppage of bile in the ducts, or to a change in the composition of the bile:—

(1.) Organic diseases of the secreting organ (of the liver, or rather the cells of the liver).

(2.) All diseases of the bile-ducts, whether of the smaller ducts or of the larger ones.

(3.) Partial or complete blocking of the larger ducts.

(4.) Catarrhal condition of the gastro-intestinal tract.

(5.) Foreign bodies and parasites getting, in some way or other, into the bile-ducts and the gall-bladder.

As indirect or predisposing causes I consider the following as most important, from my own experience:—

- (1.) Sex.
- (2.) Heredity.
- (3.) Age.
- (4.) Social position and habits of life.
- (5.) Mental anxiety.
- (6.) Habitual constipation.
- (7.) Frequent pregnancies.
- (8.) General disturbances of assimilation, and chronic exhausting illnesses.

Sex.—It is admitted by all authors that cholelithiasis is more common in females than in males; and even admitting certain differences in the proportions, the fact still remains the same, and the explanation of it is not altogether easy. >It can only be supposed that a sedentary life, insufficient exercise, a taste for sweet and farinaceous food, laziness, easy excitability of the nervous system, obstinate constipation (to be found in the majority of women), and finally, the sexual functions, are all predisposing causes of gall-stones in the female. ✓

Heredity.—Every physician who has had an opportunity of treating any considerable number of cases of gall-stones, and who has inquired into the family histories of his patients, will have assuredly found how frequently gall-stones occur as a family complaint; and most authors have laid great stress on this as

a predisposing etiological factor; but it is not transmitted directly in the sense that syphilis and tuberculosis are inherited. My own observations fully confirm this supposition: in 62 per cent. of all my cases the disease has been traced in the families of the patients in some cases as far back as the grandparents. Often have I treated mothers and daughters for cholelithiasis, and sometimes have had both under my care at the same time.

Age.—My statistics of age, although only of relative value, show that cholelithiasis is most apt to occur in men between the 40th and 60th years, and in women between the 30th and 50th years of life. Several observers state that the disease occurs more frequently at a later age. Obviously, I could not confirm these opinions from my own experience, for, in the first place, gall-stones cause few symptoms in later life, and old people do not easily make up their minds to undergo a journey for the Carlsbad treatment unless there are urgent reasons for it. At the same time, it cannot be denied that gall-stones do occur often in elderly people; but then they are symptoms of advanced age, and can easily be explained as such.

Social position and habits of life.—While all the reasons above given especially favour the formation

of gall-stones in the female sex, social position and habits of life are also most important etiological factors. Among 472 cases of gall-stones occurring in men during the last nine years, the different classes were represented as below:—

Physicians	45
Officials	74
Manufacturers	19
Clergymen	60
Large landed proprietors	24
Merchants and bankers	40
Small landowners	26
Military officers	40
Professors and teachers	103
Tenants	41

By far the largest proportion (about 50 per cent.) is furnished by the group of professors, teachers, officials, and clergymen, whose professions are naturally connected with great mental activity which is often accompanied by anger and excitement, so that as a consequence the nutrition of the liver and digestive tract is not so good as it should be. Again, the luxurious mode of living which nowadays so generally prevails among the so-called better classes helps to explain the fact that gall-stones occur much more frequently with the rich than with the poor.

Mental anxiety.—Many patients state positively that they have acquired the disease as a consequence of frequent mental disturbances of anger, anxiety, or other worries. This statement is no doubt true in many cases; but some caution is necessary in accepting it in all, as many persons who date their first attack of colic soon after and as a result of some definite mental disturbance must necessarily have had the concretions forming for some time before. On the other hand, we know well from everyday experience what influence psychological phenomena such as anger, worry, nausea, terror, &c., do exert on the secretion and excretion of the bile, as well as on other organs; so that we cannot doubt the possibility of their influence in causing the formation of gall-stones.

Chronic constipation.—I have already pointed out in my first pamphlet, the casual relation which must exist between cholelithiasis and chronic constipation. More than 80 per cent. of my cases suffered from chronic constipation,⁴ and only 20 per cent. had regular action of the bowels, and nearly all the patients said confidently that the constipation was of longer standing than the cholelithiasis.⁵ Considering these facts, and further considering that the removal of constipation is the first step towards

curing cholelithiasis, and that after this is relieved the action of the bowels improves in regularity, we cannot doubt but that there is a casual connection between constipation and gall-stones. It is questionable how far this relation can be fixed with scientific accuracy, but there can be no doubt that a regular and plentiful flow of bile is a *conditio sine quâ non* for a healthy action of the alimentary canal.

>The evil effects of chronic constipation are partly due to the actual pressure which the overfilled intestine exerts on the gall-bladder, and partly due to a catarrhal condition of the intestinal mucous membrane which is set up by the constipation, and is apt, under certain circumstances, to extend to the mucous membrane of the bile-ducts. To this may be also added the irritation of the alimentary canal produced by the irrational use of strong purgatives which have often been taken in large quantities extending over a long time, and this irritation is not only confined to the stomach and duodenum, but extends into the common bile-duct, and causes alterations in the chemical composition of the bile. ✓

Frequent pregnancies.—The older writers as well as the more recent ones, with few exceptions, consider that frequent pregnancies may be a cause

of cholelithiasis, and my own observations fully agree with this idea.

In a very large number of cases the first attack of colic occurred during pregnancy or shortly after delivery, and most women voluntarily state this fact just as they will often mention that attacks often come on with or during menstruation. >The more obstinate constipation during pregnancy, the pressure of the pregnant uterus upon the liver and gall-bladder, the alterations in the circulation and variations in the quality of the blood itself, seem to me to be all indirect causes of the formation of gall-stones in pregnant women.* Professor Freund of Strassburg (as he told me personally) has often observed that women from whom he had removed large abdominal tumours, were attacked with biliary colic soon after the operation. >In such cases the tumour seems to have acted like a pregnant uterus: by its pressure on the liver and gall-bladder, it caused the excretion of bile to be slow, and so favoured thickening and formation of a deposit; then when the pressure of the tumour was removed, the gall-bladder, restored to activity, contracted, and tried to drive out the stone, and so caused the first attack of colic (as *post partum*).¹

General disturbances of assimilation.—An abnormal deposit of fat, which is in itself a disturbance

of assimilation, produces also other disturbances, and amongst them the formation of gall-stones. The deposit of fat, especially in the abdomen, acts in a mechanical way by preventing normal peristalsis of the intestines, interfering with the functions of the liver, and impeding the circulation of the blood, and causing after a time alterations in its composition, which later on lead to modifications of the bile, and cause the cholesterin to increase in quantity, and the watery constituents to diminish, so forming the preliminary conditions for the deposit of concretions. Besides this, every general disturbance of assimilation will tend gradually to produce alterations in the composition of the blood, which will in its turn modify the composition of the bile, and under certain circumstances will lead to the formation of gall-stones. In many cases, which are remarkable for their frequency and so worthy of careful consideration, patients date their present disease from severe typhoid fever complicated in most cases by relapses, or from other long-lasting and exhausting diseases (scarlatina, puerperal process, &c.). Besides this, it is a well-known fact, that at post-mortem examinations gall-stones have often been found in those who have suffered from tuberculosis, and also in those who have been confined for many years in asylums or prisons. With good

reason and accuracy Fauconneau Dufresne,¹ gives to these and other similar causes the title "*Conditions qui ralentissent le cours de la bile.*"

Naunyn mentions, under the "literature" of the subject, a book by Cyr—*Traité pratique des Maladies du Foie*, par S. Cyr. Paris: Baillière et fils, 1887. The author, with a perfect knowledge of nearly all the literature of the subject, and by virtue of his own extensive observations as well as of the views of the best authorities, has written an excellent book on diseases of the liver, which I am sure will give the greatest satisfaction to every professional man. As a matter of fact, the chapter on cholelithiasis was the one I took most interest in, especially as I found that the author holds nearly all the same views which I have stated in my various papers on this subject. Thus, for instance, the etiological factors are described and tabulated in Cyr's book very nearly in the same way that I did them myself. But what I was most surprised to find was that Cyr was the only author I knew who considered there was a prodromal state of cholelithiasis (*Période prodromique*).

¹ F. D., *l. c.* p. 142.

IV

SYMPTOMS AND COURSE

A. Prodromal State

THE formation of concretions takes a certain time, and presupposes that the bile has changed physiologically as well as chemically, and in my opinion takes at least several months. It is obvious that an abnormal condition of the bile must lead necessarily to more or less perceivable disturbances of digestion, assimilation, and general health, both before and during the formation of the concretions. For the symptoms I am going to still further specify we have no pregnant term; I shall therefore keep up the designation I have already chosen, viz., "Prodromal state of cholelithiasis." Among the symptoms which occur (like the cholelithiasis itself) much more frequently in the female than in the male sex, disturbances of digestion are the most prominent; they are the first to occur and are the most typical—viz., constipation, flatulency, small or capricious appetite, sense of pressure in the region of the stomach, often

radiating to the right side, more seldom to the left. The skin, especially of the face, loses its healthy colour, gets pale and yellowish, until it becomes a greyish-yellow colour. The conjunctiva shows, especially in its lower third, a tinge of yellow not perceived distinctly unless the lower lid is drawn down and the eyeball rolled upwards. The urine gets more scanty, and becomes clouded on standing. It is saturated with uric acid, and deposits a sediment. At first biliary pigment is absent, but at more advanced stages it is always to be found, though only in small quantities. Another general symptom which seems to be closely connected with functional derangement of the biliary apparatus is bilious headache or migraine, and it is very striking how many patients state that as soon as they had their first attack of biliary colic the attacks of migraine became more and more rare till they ceased altogether. In this state no palpable changes of the abdominal organs can yet be found, although they already exist, but not distinctly enough to be made out by external examination—a change in the normal quality and secreting activity of the mucous membrane of stomach and intestine; a catarrhal condition which will extend to the bile-ducts. That would be the time to arrest by proper therapeutical measures the patho-

logical changes already existing as well as those which would naturally follow later ; but how seldom, if ever, is this done ! The sufferers do not feel ill enough to seek medical advice ; all they do is to use some home remedies, for the most part irrational purgatives, which only make their condition worse ; and even if they do consult a physician, the result is, for many reasons, but in few cases, a radical cure.

7 As soon as the catarrhal process spreads to the bile-ducts, the above symptoms become more strongly marked, and new and graver ones are added. There is almost a complete loss of appetite, the tongue becomes furred, breath offensive, increased acidity of the stomach with most disagreeable flatulence occurs, and the abdomen becomes distended and very sensitive to the slightest pressure in the epigastric or right hypochondriac regions. In some cases, even at this early stage, there is gastralgia, which is frequently, though erroneously, thought to be due to an ulcer of the stomach. Constipation probably gets still more marked, and the fæces show little coloration from bile ; the icteric phenomena become fairly distinct (though not yet very pronounced at this stage), sometimes accompanied with itching, and sometimes not. Sleep becomes troubled and defective, the patients visibly lose flesh, and become nervous and irritable

to the highest degree, &c. Physical examination of the abdomen shows an increase in size of the liver, and on palpation an increased hardness of the organ can be made out, which as a rule is elastic, and the heart is thus already working under disadvantageous circumstances. In the urine, bile pigment can already be found in larger or smaller quantities. The bile, altered both physiologically and chemically, is so much changed that under the influence of other favouring circumstances thickening of the bile will now take place, and if prompt and energetic measures are not taken, the condition becomes further aggravated by the actual formation of concretions having taken place; and this advanced condition will be the subject of our next consideration."

B. Symptoms of Gall-Stones and Biliary Colic.

It is a well-known fact that gall-stones, even the largest, sometimes cause very few symptoms so long as they lie quietly in the gall-bladder, so that the patient may reach an old age with very little suffering; but as a rule their existence causes considerable local disturbances which may be so severe as even to endanger life. And if the formation of concretions is already in itself a disturbance of alimentation, other general and more severe disturbances will

follow in consequence; so that the disease from the first should be looked upon seriously, and treated accordingly. The local symptoms begin very differently, often felt first as general sensations of malaise and pressure; these are followed later by transient pains and sudden periodically returning attacks of colic, which occur in paroxysms, and are accompanied by intolerable pain. Mild attacks of colic may also be set up by the passage of thickened tar-like bile or biliary gravel of large quantities passing through the ducts.

Violent attacks of colic are only brought on by the stones passing through the narrow ducts, or by tearing, irritating, or forcibly distending them. As already mentioned, most concretions are found in the gall-bladder itself; but under certain circumstances both gravel and stones may also be found in the smaller bile-ducts within the liver. These stones usually escape without very violent attacks of colic, either through the hepatic duct into the gall-bladder, or into the common duct. Acting as foreign bodies, they cause irritation of the walls of the bile-ducts, and so may lead to ulceration, or even formation of an abscess; but such results are, as already stated, quite exceptional.

The stones are moved, partly by muscular con-

traction, and partly by the pressure of the bile acting as a *vis a tergo*. Whether a certain amount of force is produced by aspiration from the intestine as well, which would aid the gall-stones and bile in getting out of the ducts, has never hitherto been satisfactorily proved, though it may be admitted as possible. According to Hyrtl, both the gall-bladder and the larger ducts are contractile, possessing muscle fibres which are a continuation of those in the duodenum which pass along the ductus communis and the cystic duct to the gall-bladder. Within the liver and in the hepatic duct it is simply the flow of bile which causes the expulsion of the stones; but in the gall-bladder, common duct, and cystic duct, there is also added the force of muscular contraction. We know that the flow of bile is most plentiful when the contents of the stomach have passed into the intestine, producing a stimulation of the diverticulum Vateri when passing through the duodenum. The onward movement of all concretions is produced by this augmented flow of bile, and thus the fact, that most attacks of colic take place between two and three hours after a meal, is accounted for.

It is by no means easy to describe a fit of colic, and from what I know of my own experience (I have suffered myself from gall-stones for years) and

numerous experiences of others, I have come to the conclusion that every description falls far short of the reality. In some cases the fit begins with a slight chill, general malaise and pains in the abdomen, which—at first general—soon become localised in the epigastric and right hypochondriac regions. In other cases the pain begins acutely, and the patient who has gone to bed quite well, awakes, after a sleep of between two and three hours, with most agonising pains. These pains will become less now and then if the patient succeeds in eructating a few times; the respite is usually, however, quite transitory. Then the pains begin again with renewed violence, become spasmodic, and radiate over the thorax. Respiration becomes laboured, the face is cyanotic, and the expression is that of the most acute pain and distress quite beyond powers of description. The conjunctivæ become suffused, and the eyeballs become prominent, standing out, as it were, from their sockets. Lastly, retching takes place, which is soon followed by vomiting, and with this the attack often entirely passes off, but at other times soon again returns. The pains, at first radiating over the right side of the thorax, extend (if the attack lasts long enough) into the corresponding half of the back, passing over the region of the right scapula, right shoulder, and upper arm,

and are often felt very intensely over a small circumscribed area in the lower part of the back and close to the vertebral column; still the climax of the attack is not yet reached. Fresh paroxysms follow rapidly one after the other, and all the symptoms may become more marked: the difficulty of respiration and the anxiety which it causes, the pains, the retching, and vomiting all increase until apparently beyond endurance, and the patient in vain seeks relief by continually changing his position. From his back to his side, then on to his belly and knee-elbow position, now stretched out and now doubled up—from the bed he throws himself on to the sofa, and from the sofa often on to the floor—and so tires himself out, until, with a certain degree of exhaustion, some temporary relief takes place, which again may pass into a fresh paroxysm.

In addition to all that, the patient has a slow hard pulse, cold extremities, collapsed features, and a dry tongue; a cold sweat breaks out on his forehead, and he is a complete picture of physical exhaustion. Thus things may go on for many hours, and with short interruptions for days even, when the fit either ceases altogether, or passes into a more chronic condition in which the pain, although lasting, is of much less severity than the acute attack.

Let us point out once more the chief symptoms of an attack of biliary colic :—

(1.) Sudden onset between two and three hours after a meal, and most often during the night.

(2.) Violent, spasmodic, paroxysmal pains over the hepatic and epigastric regions, radiating upwards over the right half of the thorax.

(3.) Laboured respiration, feeling of distress, nausea and vomiting.

(4.) Slow hard pulse and cold extremities.

(5.) Sudden or gradual termination of the attack.

(6.) Onset of jaundice, which under certain conditions follows the attack.

I. According to my experience, colic, as a rule, comes on suddenly; but there are a large number of cases in which it comes on gradually, beginning with general feelings of malaise, chilliness, abdominal distension, sense of pressure in the epigastric region, desire to eructate without being able to do so, yawning, and other general symptoms. The reason the fits usually take place between two and three hours after a meal is on account of the increased flow of bile which takes place during digestion. I have also observed that attacks of colic more often come on in the night than in the day-time.

During the season of 1889, when I made special notes on this subject, I was called out to people suffering with gall-stones 62 times at night and 16 times in the day. The possible explanations of this may be, that, as a rule, little or no exercise is taken after supper, or that indigestion has been produced by eating and drinking too much, or that the patient has simply gone to bed too soon after supper, and so retarded the digestive process by sleep.

II. The characteristic points of the pain of colic are its occurrence in paroxysms, its gradual increase in intensity, and its distribution and transmission to neighbouring sensitive spots. The pain does not, as a rule, begin in the region of the gall-bladder, as we should naturally expect, but in the epigastrium—in the so-called pit of the stomach; but it is soon felt in the hepatic region, and almost at the same time all over the right half of the thorax, and occasionally over the left half as well. Pains also may occur in the left hypochondrium, which, from their position, appear to be in connection with the stomach and transverse colon. The diaphragm is also affected, and this, together with the simultaneous contraction of the thoracic muscles, is the explanation of the difficulty in breathing which is present during an attack. The typical distribution of the pains are truly pathog-

nomonic of biliary colic. The radiation over the right half of the thorax (I never missed it in any fit of long enough duration), with a concentration of the pain over the lower part of the scapula, and (in case of a stone being impacted in the cystic or common duct) over the lower part of the back of the thorax close to the vertebral column, are all characteristic of this affection. I may also mention that in very severe and protracted attacks the pains also reach to the neck and back of the head, as well as the shoulder and upper arm, which may be semi-paralysed in consequence of them.

III. Nausea and vomiting are reflex phenomena which are seldom absent from an attack of biliary colic. Vomiting sometimes produces a remission, which, however, is seldom lasting, there being merely a temporary lull in the pain. Patients soon get to know this, and try to bring on vomiting as soon as possible by drinking hot liquids, or even by introducing the finger into the pharynx. The former method is at any rate harmless, and may even be recommended; but the introduction of the finger may do harm, and ought decidedly to be avoided.

IV. The action of the circulatory system is affected in all fits of colic, and becomes weakened, as is seen by the impaired respiration and partly by a transitory

interference with the enervation of the heart. I have seen the pulse rate get as low as 42 beats per minute. In severe and protracted attacks the heart gets so much weakened that a fatal termination from collapse is always a possibility. The temperature is either normal or sub-normal, the hands and feet are icy-cold, and the forehead and head are covered with a cold, clammy sweat. Reaction begins between the paroxysms of pain, but does not become complete until the intensity of the attack is entirely over.

V. If the stone slips back into the bladder, or if it forces its way through the cystic and common duct into the duodenum, the symptoms cease immediately, and it is really wonderful to see the patient, who at one moment is tortured by the most terrible pains, and shrieking loudly, the next moment free from pain, and expressing great delight at the deliverance from the attack. This delicious feeling, as I would call it, is immediately followed by a period of prostration and weakness which varies in direct proportion to the intensity and duration of the fit. In some cases the attack does not yield suddenly, but only very gradually; or, to state it better, the attack loses its acute characteristics, and becomes more chronic. This is the case when the stone becomes impacted for a long time in the

cystic or common duct. Instead of the spasmodic intense pains increasing in violence, dull, boring pains come on, which the patient gradually gets accustomed to, and which are only varied by the stone moving on; so that the chronic state often alternates with acute attacks, until, in the more favourable cases, the stone in some way or other reaches the intestine, or, in the less favourable, some complication or sequela causes a fatal termination. As long as the stone is incarcerated in the cystic or common duct, the patient feels the pain, which has been repeatedly referred to, at the lower part of the right half of the thorax close to the vertebral column; while the pain in the region of the scapula nearly always ceases with the cessation of the acute attack.

VI. It is true that the discovery of a stone or the appearance of jaundice are still the indispensable requisites for many physicians before finally diagnosing the condition of cholelithiasis, but happily of late these two signs have not had the diagnostic importance attached to them which they had in former times. The jaundice is not the result of the colic itself, but simply results from a more or less complete blocking of the hepatic or common duct followed by a reabsorption of the bile. Therefore the icterus is *a priori* excluded from attacks of colic

caused by the incarceration of stones in the neck of the bladder and the cystic duct; for when these are blocked, the bile can still reach the intestine by passing straight from the hepatic into the common duct. Incarcerations in the hepatic duct can hardly be diagnosed; it occurs rarely, because the lumen gets wider as it approaches the common duct, and the stream of the bile is usually strong enough to drive the stone on. The passage of biliary gravel (as already mentioned) seldom causes symptoms of incarceration, and still more rarely jaundice, which, if it does occur, is very slight, as I have sometimes had occasion to observe; and even gall-stones as large as peas may pass through the ductus communis without any great pain and without distinct jaundice, if the passage goes on so rapidly that only a transitory blocking of the bile-ducts takes place, or if the duct has been previously dilated by the passage of larger stones. It is proved from post-mortem records that if large stones repeatedly pass through the common duct, the latter gets so much distended, and loses its power of contractility to such a degree, that it can never again become restored to its original dimensions; so that stones (provided that they are not too large) may pass without causing any very great pain or jaundice, and will reach the intestine without much

hindrance. The symptoms of jaundice first appear from eight to ten hours after complete obstruction of the biliary passages has taken place, *i.e.*, blocking of the ductus communis or hepaticus.

Bile pigment can be found in the urine before any discoloration of the conjunctivæ or the skin is recognisable. It occurs in small quantities at first, but increases with the jaundice, and in the meanwhile the fæces are becoming a light-grey clayish colour, and have a fetid, cadaverous-like smell. Even after the stone has reached the intestine, and the bile-duct is again permeable, the jaundice still lasts several days; because the passage of the stone causes a swelling of the duct walls and an increased secretion of mucus, which together still block for some time the lumen, which is in itself naturally a small one. Besides, a certain time is necessary before the bile can be got rid of by the blood and other organs which are stained with it. On the other hand, jaundice always persists as long as the hepatic or common duct is blocked; and if it happens that, from the irregular shape of the stone, bile is able to flow past it, it will only be in very small quantities, and swelling of the mucous membrane will quickly block up any gap that may at first exist between the duct wall and the stone. In an incar-

ceration of long standing there is great danger to the patient, partly from the local effects or their sequelæ (ulceration, perforation, &c.), and partly from the retention and reabsorption of the bile. Yet it is wonderful to see how some people can stand the deleterious influence of bile circulating in the blood, while others quickly succumb to it.

As soon as the attack, with all its possible consequences, has passed (especially when the disease is of short standing), the patient generally feels quite well, so much so that he soon forgets what he has gone through, and perhaps believes himself perfectly cured, until sooner or later a fresh attack reminds him in a forcible manner that the malady is not yet over. In other cases gastric and intestinal disturbances continue more or less severely; and a feeling of pressure over the liver, with general malaise, mental depression, and increased irritability, are symptoms which are but seldom absent, especially in cases of long duration; a truly *circulus vitiosus*—at the same time acting as cause and effect.

Sometimes the symptoms of gall-stones closely resemble those of intermittent fever, for which they are mistaken and treated, until the symptoms become more distinct, and the diagnosis is rectified, and the disease treated accordingly.

Besides these there are various other symptoms and sequelæ intimately connected with and dependent on the state of cholelithiasis which deserve particular attention. Among these symptoms are dryness of skin, itching, intolerable thirst, and sleeplessness; while among the sequelæ, cardiovascular changes, dizziness, dilatation of the stomach, and changes in the structure of the bile-ducts and liver must all be enumerated.

A dry and scaling skin usually occurs in people who have suffered for a long time with cholelithiasis, and who have undergone many attacks of colic with jaundice; sometimes, however, it occurs in the prodromal stage or after slight fits of colic, and in most cases itching both accompanies and follows the jaundice.

An abnormal degree of thirst always exists during an attack of colic, and in many cases persists for a long time after, without there being any rise of temperature, and without there necessarily being any sugar in the urine.

In cases of long duration, or those in which attacks of colic are very frequent, the patients get into such a nervous condition that they are unable to sleep, and pass into a state of complete insomnia. This sleeplessness may be on account of the itching (with

jaundice), or it may be on account of the continual fear of an attack of colic during the night; patients have often told me of this fear, and although I have always tried to convince them of the uselessness and danger of such anxiety, I have never succeeded.

The heart and large arterial vessels undergo fatty and atheromatous changes, in consequence of which, frequent attacks of dizziness and sometimes complications of a more serious nature occur. These degenerative processes are partly the result of a previous tendency to the deposit of fat (a frequent cause of cholelithiasis), and are partly due to the presence of cholesterin in the general circulation (and also uric acid). Often, however, these effects are but a part of a senile retrogressive metamorphosis, the cholelithiasis being a coincidence which itself may be a sign of the same process of degeneration when it occurs in late life.

The dilatation of the stomach, in cases of gall-stones, differs from that due to stricture of the pylorus; for while the latter is stationary and incurable, that due to gall-stones may be considered symptomatic and transient, being caused, as it is, by the development of large quantities of gas in the stomach and intestines, which cause a dilatation of the stomach, and partial loss of elasticity of its walls.

Another reason is the excessive amount of fluid drunk. I have already pointed out that people suffering from gall-stones become very thirsty, and to relieve their thirst they drink abnormally large quantities of fluid. Another reason for taking more fluid than usual is the fear which patients have that solid food will bring on an attack of colic. Indeed, many patients live almost entirely on soup, tea, and coffee, only taking solids occasionally, and then in very small quantities, and much perseverance is necessary to persuade them to see the folly of their diet.

Concerning pathological changes in the bile-ducts and liver, I have already stated that they need not be present in all cases of cholelithiasis; and indeed in many cases there is only a slight harmless change in structure, or perhaps no change at all; but in the majority of cases distinct changes can be made out, for the most part, in the bile-ducts and gall-bladder. Happily, in most cases these changes are limited to certain parts of the bile-ducts or gall-bladder, and do not materially interfere with their functions; but sometimes the mucous membrane of the gall-bladder becomes inflamed to such an extent that it entirely loses its normal structure. If a large stone is permanently impacted in the neck of the gall-bladder or in the cystic duct, the bile can

neither get in nor out of the bladder, and the bladder is then, so to speak, cut off from the whole biliary apparatus, inasmuch as the bile can only flow from the hepatic duct into the common duct. The bile which remains in the bladder becomes gradually absorbed, and its place is taken by mucus which is secreted from the mucous membrane of the bladder. This mucus, at first yellow, later on loses its colour, and may occur in such quantities as to distend the gall-bladder, so that it can be felt as a distinct tumour (*hydrops vesicæ fel.*). If, however, the incarceration continues for very long, the nutrition of the gall-bladder gets more and more affected, its volume gradually decreases, and if the patient lives long enough, complete shrinking up takes place. A long incarceration of a concretion in the ductus hepaticus or ductus communis is, as already mentioned, followed by retention and reabsorption of the bile, with distention of the ducts and swelling of the liver. As soon as the obstruction is removed, normal action of the biliary processes again takes place; but frequent repetitions of incarcerations, as a rule, cause disturbances in structure and function of the liver. If the obstruction in either of the above ducts is permanent, then the so-called green softening, and later on shrinking, of the liver is a gradual but unavoidable

consequence. Finally, it must be mentioned that concretions (chiefly biliary gravel) occurring within the liver may lead to abscesses, and in the bladder and large ducts may cause, by their irritation, malignant growth; but it must also be remembered that pre-existing malignant growth of the bladder or the ducts favours formation of gall-stones, so that it may sometimes be difficult to decide which was the cause and which the effect.

In the *Prager Medic. Wochenschrift* of 1884, No. 49, I published a case of primary carcinoma of the ductus communis, which had arisen as a consequence of a gall-stone being for a long time impacted in the duct, and the diagnosis which I made during life was subsequently confirmed by post-mortem examination.

Elimination of stones.—A stone may pass into the gut by the normal path of the ductus communis, or by perforation of the duct or bladder. Let us first of all discuss the first method of elimination, as it is the most frequent. As soon as the stone has passed from the hepatic or cystic into the common duct—*i.e.*, from a narrower to a wider passage—the elimination at once becomes more easy. But there are still many difficulties to be overcome; the length of the duct, the size and shape of the stone, and lastly the termination itself of the common duct, all

offer obstacles to the passage of the concretion. (A round stone will pass more easily than an angular or irregular one, and a small one more easily than a large one.) The longer a stone is retained in the common duct, the more difficult further movement becomes. First of all, the mucous membrane of the duct is in constant contact with, and irritated by, the stone, and this continual irritation causes the duct wall to swell, and clasp the stone more tightly; and secondly, the stone is always increasing in size by the deposit of fresh precipitates on that side of it which receives the stream of bile against it. This increase of size, even if only in one diameter, naturally makes further movement more difficult. Even when the stone has gradually worked itself through the duct as far as the outlet (*pars intest. duct. comm.*), renewed and stronger efforts are required to overcome this last hindrance; but if that even is passed, and the stone comes into the intestine, then the acute pains at once cease, and give place to a feeling of comparative comfort, unless the passage of the foreign body has caused some injury to the duct or mucous membrane, in which case pain and uneasiness over a circumscribed area may remain for some time. And also in some cases—viz., those in which the stone is large—injury to the mucous membrane within the

common duct, and probably still more often at the extremity of the duct, may be recognised as occurring by the feverish state of the patient (though mostly a mild kind of traumatic fever) *during* the passage of the stone, as well as *afterwards* by the circumscribed area of pain. Patients are most decided and unanimous in their assertions with regard to this pain. They feel, at the moment when the stone is passing the constricted part of the duct into the intestine, as if something is being torn inside them, and instead of the raging pains of the colic a sore burning sensation is felt which can be accurately localised, and corresponds to that part of the intestine into which the duct enters. Under unfavourable circumstances, the stone—if very large, or angular, or nodulous, or if the strength of the patient has been exhausted by frequent or very severe attacks—may remain for a long time, or even permanently impacted, in the common duct; and there are cases known where the stone has reached the intestinal end of the duct, and even partially protruded through the orifice without being able to complete the passage. The forces had not been strong enough to expel it, and the great exhaustion had brought matters prematurely to a fatal termination.¹

¹ Murchison, *l. c.*, case 117, p. 378; and the *Lancet*, June 6, 1885, p. 1025.

With regard to the size of stones which can possibly pass through the common duct, the statements in the literature of the subject are scanty and contradictory in nature. According to Hyrtl,¹ gall-stones the thickness of a finger may be evacuated in the natural way — viz., by the ductus communis. He mentions one instance of a stone, which he saw at Dr. Pöschman's at Carlsbad, half an inch in thickness, and three-quarters of an inch in length, which had been evacuated in the fæces after violent attacks of colic.

George Budd² says: "One is occasionally surprised at the large size of a stone which has passed through the duct into the intestine without ulceration, when one considers the natural size of the duct, and finds that a stone as large as an almond, or larger, may escape this way. The common duct has sometimes been found wide enough to admit a finger, or even more, a long time after the stone which caused the dilatation has been got rid of."

I myself have also observed that if a fairly large stone has passed through the ductus communis, the latter does not again completely contract (especially the pars intestinalis), but remains widened, and offers

¹ Hyrtl, *Topog. Anat.*, p. 665.

² George Budd, on "Diseases of the Liver," 2nd edit., p. 361.

far less resistance to the passage of any stone in the future; so that the later stones will cause much less pain, provided they are not larger than the first one.

Fiedler¹ thinks that stones which are larger than peas cannot pass the ductus communis without difficulty, and that larger ones but seldom come even into this duct; and he does not believe they can get through the diverticulum Vateri without ulceration.

Schuppel² even thinks that 1 cm. is the largest diameter with which a gall-stone can ever pass through the diverticulum.

Before giving my own views, I will state the facts which I have obtained from post-mortem records on the subject.

1. In a woman 73 years old, some two dozen concretions the size of large beans were found in the common duct, the duodenal end of which was in consequence much distended, and projected peg-like into the duodenum.

2. In a woman 43 years of age, in the duodenal end of the common duct, a gall-stone as large as a pigeon's egg.

3. A woman aged 45—in the common duct a pigmented chalk stone the size of a small walnut.

¹ Fiedler, *l. c.*

² Schuppel, in *Ziemssen's Magazine*, Diseases of the Liver, p. 219.

Fauc. Dufresne¹ publishes (1) the case, observed by Lieutaud, of a child born with jaundice which lived for twenty-five days, continually crying out, whose gall-bladder and large bile-ducts at the post-mortem examination were found filled with stones, and a stone the size of a pea was found at the entrance of the ductus communis into the duodenum.

(2) A case observed by himself, where a big stone projected from the ductus communis into the duodenum.

(3) A case observed by Andral, where several stones were congregated together in the duodenal end of the ductus communis, distending the aperture, and vaulting its mucous membrane in such a way as to give it the appearance of a protruded anus.

Frerichs² (case 67) describes a ductus communis, wide enough to admit a finger, containing, one inch above the intestinal opening, a conglomeration of stones nearly as large as a hen's egg, made up of two large and several smaller ones.

George Budd³ found in a woman, aged 29, a gall-stone as large as a walnut in the common duct.

Murchison⁴ (case 116) gives an account of a case

¹ F. D., *l. c.*, p. 179.

² Fr. Th. Frerichs, *Klinik der Leberkrankheiten*, 2. Band, p. 431.

³ G. Budd, *l. c.*, p. 220.

⁴ Ch. Murch., *l. c.*, pp. 367-370.

of colic which was followed by the evacuation of two stones as big as cherry-stones, and two days later of a large round stone (two inches in circumference) through the ductus communis. This case is specially decisive, given on the authority of Murchison, who had opportunity of observing its whole course in his ward.

Murchison (case 117). Fatal termination of jaundice in consequence of the ductus communis being blocked by a large stone. The ductus communis was distended enough to admit the index finger; in the duodenal end was impacted a large gall-stone (one inch long and half an inch thick), which was partly projecting through the aperture into the intestine, the mucous membrane of which was torn and ulcerated round the stone.

Murchison adds that in this case there were no complications, but that death was caused by exhaustion, which is a rare occurrence; and had this patient lived a few days longer, it is probable that the stone would have completed its passage into the intestine, and the woman would have been saved.

M. Roth¹ quotes an account of a post-mortem examination of a woman aged 59, in whom the inferior part of the ductus communis as far as the

¹ M. Roth, *l. c.*

ostium duodenale was enlarged to the thickness of a finger for a length of 5.5 cms. by several faceted, tightly-incarcerated concretions of walnut size, and looked like a piece of twisted rope. The pars intestinalis was projecting as a protrusion 2 cms. in length and 12 mms. in height into the duodenum; the opening of the ostium was about the size of a pea; its mucous membrane was tightly stretched over the foremost stone, which projected some distance into the gut. The rest of the bile-ducts were a good deal distended; the gall-bladder contained six other stones, and its mucous membrane was eroded in the region of the fundus. This case is also remarkable, inasmuch as death occurred during the fit, or shortly after, without any perforation, peritonitis, or other special changes. Likewise interesting is the case marked as No. 4. A woman aged 64. Gall-bladder the size of a bean. Ductus communis very wide, containing up to the diverticulum Vateri about a dozen stones the size of walnuts.

George Harley¹ also mentions a series of cases bearing on this question.

Cyr thinks, generally speaking, that stones above 3 to 4 cms. in size cannot pass into the duodenum; but **Naunyn**, from his own observations, is of opinion

¹ George Harley, "Diseases of the Liver," London, 1883.

that stones the size of a hazel-nut kernel may still pass the ductus communis.

I have mentioned these cases so as to illustrate all phases of the passage of stones through the ductus communis, from which some approximate conclusion may be drawn as to what sized stone may pass, under favourable circumstances, through the common duct.

During my twenty-five years' practice at Carlsbad I have seen hundreds of cases of biliary colic. I have been able to observe and follow their course, and some idea of the bulk and size of concretions may be gathered from my large collection.

As an outcome of my own observations over a large number of years, I can positively state—

(1.) That the majority of concretions reach the intestine through the ductus communis.

(2.) That the size of evacuated stones generally varies from that of a small pea to a hazel-nut.

(3.) But that stones the size of a bird's egg (viz., with diameter of thickness up to $1\frac{1}{2}$ cm., and even a little larger) may also pass the diverticulum Vateri, where it is naturally possible that its mucous membrane may become ulcerated or torn. These views do not only rest on my own observations, but also on the well-known fact that the ductus communis is capable of becoming enormously dis-

tended. (Frerichs, Rokitansky, and Treitz.) This is also illustrated by the above post-mortem records, and especially by the case observed by Murchison and published as No. 116. On the other hand, those stones having their diameter of thickness considerably more than 2 cms. will very rarely come into the ductus communis; and hence they will only in very favourable cases be able to reach the intestine by ulceration. Very large stones, which, happily, seldom occur, usually remain in the bladder. Now and then they cause wonderfully little trouble, but they may reach the intestine (more often the colon than the duodenum) or the peritoneal cavity by a process of ulceration. The perforation may either take place with great general disturbance followed by peritonitis and severe hæmorrhage; or it may be a more gradual process, which naturally takes longer, but involves less direct dangers to the life of the patient. Perforation is favoured by long and exhausting diseases. The gall-bladder generally possesses a certain amount of toleration to gall-stones, but loses, like all other organs in advanced age or after exhausting diseases, its power of resistance; and under such circumstances, partial necrosis and perforation of the bladder wall, with or without adhesion to neighbouring organs, will more easily take place. It also may happen, though

rarely, that gall-stones pass off by the intestine, and are found quite accidentally without any of the signs or symptoms which might have been expected in the individual in question. These concretions which are discovered in the evacuation simply on account of their large size, can only come by ulceration (and after previous adhesion of the gall-bladder to a neighbouring segment of the gut) into the intestine. The whole process is so latent that the patient only finds out what a danger he has escaped from by the accidental discovery of the stone. I have published a case of this description which occurred in my own practice, in the *Prager Medic. Wochenschrift*, 1881, No. 11; and another is mentioned by Ord¹ in a lecture delivered at the British Medical Association. These two cases are, as far as I know, the only ones published hitherto, which is proof enough of their rare occurrence.

Gall-stones may find their way into the stomach and be got rid of by vomiting. Accounts of such cases are found in the literature of the subject by Thomas Coe,² George Harley,³ Fauc. Dufresne,⁴

¹ W. M. Ord, *Brit. Med. Journal*, 1887, March 5, p. 496.

² "A Treatise on Biliary Concretions," by Thomas Coe, M.D., Lond., 1857.

³ G. Harley, *l. c.*

⁴ F. Dufresne, *l. c.*, p. 258.

Murchison,¹ and Thudicum,² and they certainly occur more frequently than is generally supposed. They easily escape detection, as usually no attention is paid to the matter which is vomited. The vomiting is a reflex action, and with its onset the colic often entirely or temporarily ceases. This fact was known long ago, and led to the use of emetics, which have now been given up. I can easily imagine that a violent attack of vomiting, with the pressure of the abdominal muscles, might materially assist a concretion in its passage through the duct. And if, during a severe attack of retching, a stone gets into the duodenum, a reversed peristaltic action might easily send it into the stomach, whence it would be got rid of by vomiting; but how rarely has a medical man the chance of examining the vomit. He may see it if he is present during an attack, but even then it is not often carefully examined. I happen to have twice witnessed the vomiting of a gall-stone. In one case (1881) of a lady aged 38, and jaundiced, who was thought by her medical attendant to be suffering from carcinoma, a large amount of slimy fluid of a muddy green colour was vomited into a basin, and as a solid body was

¹ Murchison, *l. c.*, p. 293.

² Thudicum, "A Treatise on Gall-Stones," p. 237.

heard to strike the side of the basin, I cautiously poured off the fluid and found a gall-stone as big as a cherry-stone, with millet-seed-like excrescences. Within eight days the jaundice entirely disappeared, and during the further observation of the case the general condition improved so much that the lady even increased in weight. The second case—a woman, aged 52, had undergone severe and repeated attacks of colic, and is said to have always had attacks of retching, but never actual vomiting. After feeling well for six days, she suddenly had a severe attack of biliary colic and retching, for which I was sent for in the night. I at once gave a pretty strong hypodermic injection of morphia, and (whether *post hoc* or *propter hoc*, I will not decide) the sick woman, who had till then been retching and choking very severely, suddenly began to vomit with such great severity that she hardly had time to bend over the bed. The vomit fell right on to the floor, and I heard a solid body fall. My first impression was that an artificial tooth had fallen out, but this was not the case, and after looking for some time the *corpus delicti* was found—a gall-stone as large as a pea, and shaped like a tetrahedron.

The cases where gall-stones get, by ulceration and perforation, or by the track of a fistula following an

abscess, into neighbouring organs other than the intestine—*e.g.*, the peritoneal cavity, the abdomen, the pleura and lungs, the right urethra, or even through the abdominal wall itself—are exceedingly rare, and only need to be simply mentioned.

V

DIAGNOSIS AND PROGNOSIS

ONLY he who has seen and observed many cases of cholelithiasis, and knows precisely all the different symptoms, will not be long in giving the right diagnosis in any given case—even when he does not just find the patient in an attack of colic, but is obliged to make his diagnosis from the history of the patient or of his friends round him.

However, many cases are not properly understood or appreciated till after years! I am only now stating a well-known fact, without entering into reasons; but it must be admitted that the matter is not always so easy, especially when a given case does not show the regular symptoms, or shows them in some unusual way, or (and this is a very difficult case to diagnose) when the symptoms are of such a nature that they might with a certain claim of authority be put down to some other disease. The best proof of what has just been said, if any proof is wanted,

is offered by one of Gairdner's¹ lectures delivered in his Clinic, May 26, 1885, and published fully in the *Lancet*. This clinical professor, highly esteemed as teacher and experienced diagnostician, declares in plain terms to his audience that he has not made a complete and exact diagnosis ("the case is illustrative of an oversight or omission, if not error in diagnosis") of a certain case, though the patient was watched and treated in his Clinic, the first time for three months, and the second time, it is true, for only five days; and he explains why the correct diagnosis of the chief evil, "cholelithiasis," was not made during life, but only at the post-mortem examination. It would be too long to give the whole lecture here. Those who are specially interested in it I must refer to the original, but particular attention is called to the following points:—

(1.) An affection of the heart complicating the case was diagnosed during life.

(2.) The symptoms of cholelithiasis were so indistinct and non-characteristic that the failure to diagnose it may be perfectly accounted for.

(3.) The second time the patient was examined (May 18, 1885), which was a month after she had been dis-

¹ Clin. Remarks on a Case illustrating Liability to Error in Diagnosis. By W. T. Gairdner, M.D., Prof. of Med. Univ. of Glasgow.—*The Lancet*, June 6, 1885.

charged, Gairdner found the very same state existed as when she was discharged.

(4.) The third day after examination the pulse and respiration were accelerated, which were thought to be due to some affection of the stomach. No fever while under observation.

(5.) On the fifth day at 2 A.M. patient had a rigor, which was followed later by a rise of temperature (102.4°); pulse small, and difficult to count; at 6.30 P.M. the temperature 103.6° F., very violent pains in upper part of the abdomen, followed by unconsciousness and death at 9 P.M.

(6.) At post-mortem examination one gall-stone was found in the intestinal part of the common duct, and in a much-distended although not tightly-stretched gall-bladder forty-four more. The larger ducts were so distended that even the biggest of the stones found (with diameter of half an inch) could not block up the common duct, so that there was no jaundice and no bile pigment in the urine!

(7.) **Remarks.**—Patient died of an impacted gall-stone, or rather of a gall-stone *in transitu*, that is to say, on account of pains and exhaustion. If the system could have borne the pains one or two hours longer, the stone, which, *in flagrante delicto*, was already close to the very end of the intestinal end

of the ductus communis, would have passed into the intestine, and the woman might possibly have lived.

(8.) **Conclusions.**—This case proves that a stone, although not completely blocking the passage of bile, may cause great pains, and even death; and that, under certain circumstances (and probably it had previously happened in this case), a certain number of stones may reach the intestine *per vias naturales* without even once causing icterus.

The following diseases, which may under certain conditions bear more or less resemblance to gall-stones, may be mentioned here: they are—gastralgia; ulcer of the stomach or duodenum; hepatalgia; intercostal neuralgia on right side; renal colic and floating kidney of right side; and finally, tumours of the liver, gall-bladder, common duct, and their neighbouring parts.

The first fits of colic, which are usually slight, are almost invariably designated by patients as cardialgia, a term sometimes current even with medical men; besides, true gastralgia is comparatively rare, and when occurring, may be attributed to over-acidity of the stomach, to scarred contractions after gastric ulcer, or, with women, to diseases of the internal organs of generation, the uterus and its appendages, and it is

really surprising how cardialgia sometimes promptly disappears when some uterine affection has been relieved.

A special consideration given to any affections of the stomach which may be present or past, and, if in the female sex, a close examination of the organs of generation, will make that part of the differential diagnosis more easy.

While cardialgia usually comes on with an empty stomach, and is sometimes completely relieved by taking food, biliary colic, as a rule, comes on two or three hours after a meal. In cardialgia, if the pains radiate they are limited to a spot opposite the so-called pit of the stomach (their apparent localisation being in the vertebral spine), and never spread upwards towards the right shoulder; the liver remains normal, it is neither enlarged nor positively tender on palpation, which are, again, sufficient points for arriving at a diagnosis.

Gastric or duodenal ulcers are sometimes diagnosed or said to be possibly present during an actual case of cholelithiasis; and really few symptoms are quite characteristic, while most of them may be common, to each of these three diseases. Some clue is obtained from age; not so much by sex. But the hereditary influence, and above all, the *anamnæstical* dates, ought

not to be passed over. While the duodenal ulcer is very rare, both forms, that and the gastric, develop slowly, and usually show their presence in some decided manner, though they may be still *in statu nascente*, and merely existing as only slight erosions of the mucous membrane. Whilst the gastric ulcer develops slowly and upon an anæmic basis, and occurs especially in persons of feeble health, the first attack of biliary colic appears suddenly and unexpectedly, and, as a rule, in well-nourished individuals. The disturbances of digestion, which, it is true, are for the most part unavoidable, develop but gradually, and only at a later period of cholelithiasis. Again, in cholelithiasis there are pauses of weeks and months during which the patient feels comparatively well; which is never the case with gastric ulcer, in which the pain arising from the ulcerated surface constantly makes itself felt, but does not occur in paroxysms. The differential diagnosis might be still further discussed, but I will limit myself to what has been said as sufficient.

Biliary colic may sometimes be confounded with renal colic on the right side, especially when the stone is situated in the pelvis, and causing then, perhaps, not only local pains, but also pains radiating backwards and upwards. The case usually soon be-

comes clear by the further movement of the stone, by the direction which the pains take into the right hypogastric region, the right thigh into the right testicle; and still more so if analysis of the urine shows other evidence of stone.

A floating kidney on the right side sometimes causes colicky pains, which radiate and are accompanied by vomiting, &c., and so may be taken for biliary colic; and a palpable kidney has in some cases been thought to be a distended gall-bladder, an error only possible with a very superficial examination.

I cannot enter into a differentiation with regard to pure hepatalgia, because I have never seen it; and though I don't dare to doubt its existence, it must be much more rare than is supposed by many authors even of high reputation.

I have mentioned right intercostal neuralgia, not because a case of it can be mistaken for cholelithiasis, but because cholelithiasis has often been mistaken for intercostal neuralgia.

One is, however, often obliged (especially with older people) to make a differential diagnosis between cholelithiasis and neoplasms in the liver and the neighbouring organs, and it is often only after long observation and repeated examination, as well as after a careful consideration of all the symptoms, that any

definite conclusion as to the disease can be arrived at. Often, however, both pathological conditions are combined, and in such cases the cancer is usually correctly diagnosed, and the cholelithiasis overlooked, or, at best, added as a probable complication, a circumstance which, however, is not important from a therapeutical point of view.

In some cases of cholelithiasis the prognosis may be considered to be comparatively favourable, although it must still be considered that the evacuation of stones may cause various troubles, not only within the bile-duct, but within the intestine too. Anyhow, the favourable termination is the rule, and the unfavourable one the exception; and if there are not more cases of perfect restoration to health, it is because patients are human beings and not angels, adhering more to their own inclination and habits than to medical advice, "*Sapienti sat.*"

Before ending this chapter, I will mention those diseases which most frequently occur in combination with cholelithiasis. It has been pointed out by most authors (though doubted by some) that renal calculi and gall-stones occur in frequent combination; and even if some observers *have* found that renal calculi occur more often in men than women, the fact may still be to some extent true. For it is well known

that renal calculi escape much more easily in women than men, often causing few or no symptoms, a fact which may account for their rarer observation.

Most women only discover they have gravel or renal calculi by chance when they are ordered for some reason or other to watch their urine for a certain time, when they discover sand or stones in the vessel. Another disease frequently combined with and allied to cholelithiasis is gout, which is a second expression (considering renal calculi as the first) of the uric acid diathesis. This association has been strongly pointed out by English and French physicians, and I can confirm it from my own observations. I have also pointed out as early as 1875, during a discussion held at the Carlsbad Medical Association, and also later, in my publication quoted above, that long-lasting cases of cholelithiasis, followed by violent colics, are often complicated by diabetes mellitus, which is an observation I have repeatedly made since; so that I feel justified in supposing, under certain preliminary conditions, a connection (functional exhaustion of liver, according to Cantani) between these two diseases. But it is a peculiar fact that observations have not been published in sufficient number on this point to enable any definite etiological connection between the two diseases to be

satisfactorily made out. The following facts are what I have found in the literature of the subject.

(1.) Dr. Louis Blau¹ refers to cholelithiasis among the etiological factors of diabetes mellitus, supported by two observations of Loch and Hall.

(2.) Ord² states, on the strength of his own observations, of which he describes three cases in a more detailed manner, that gall-stones are a cause of glycosuria, and he thinks the diabetes is produced by reflex action arising from the hyperæmic condition and the irritation of the liver or the bile-ducts which the stones cause.

I am inclined from my own experience to think that cholelithiasis forms a link in the chain of those general disturbances of alimentation of which the starting-point is mostly adiposis, and to which is frequently added increase of uric acid secretion, and oxaluria (functional derangement of urinary system); and from the same source (adiposis), though often from quite independent causes, cholelithiasis is developing; and sometimes as a last link in the chain diabetes mellitus (functional derangement of the liver and portal system) occurs.

¹ *Schmidt Med. Jahrbücher*, vol. 204, p. 76.

² W. M. Ord, *Brit. Med. Journal*, March 5, 1887.

VI

THERAPEUTICS

THE general treatment of gall-stones must be directed towards getting rid of the disease, and as far as possible preventing its return. The special treatment of an attack of colic is purely symptomatic, and is best carried out by carefully watching the course of the colic, and, when needful, interfering energetically and early enough.

In treating the symptomatology, I have already pointed out the so-called prodromal state that must necessarily precede cholelithiasis, and have indicated the importance of therapeutic interference during that early period.

I will again put stress on that stage, convinced, as I am, that by suitable treatment in many a case the formation of a large number of stones may be prevented, and in a comparatively easy manner. Care should be taken to produce a copious evacuation daily; to regulate the diet by strict rules; sufficient exercise in the open air should be taken; and eventually the internal use

of alkalies will suffice in most cases to smother the evil at its origin if it is only recognised in time. But if once the stones actually exist, we must immediately try to produce their elimination whilst they are yet small, and once having succeeded in this, we must prevent any more forming by getting the bile again to its normal quality and keeping it so.

In spite of the large number of methods which have been proposed for effecting the evacuation of gall-stones, we have not yet found one which can be relied upon to act in all cases, although many have been praised as specially efficacious by those who have recommended them. According to my experience, I do not believe any specific exists, nor do I believe such a one will be found; but the principle which is the unconscious or conscious basis of all those remedies, is alone a right one, viz., that of producing copious evacuations. At the same time, we must be very careful in using purgatives, only to use mild ones which act easily, and never to use drastic ones. Hot water with bicarbonate of soda taken in large quantities, enemata, castor oil, rhubarb, and cascara sagrada, are amongst remedies I would specially recommend; as, if rationally used, they not only regulate the bowels as desired, but also, as proved by experience, assist in evacuation of small stones. Starting

from the knowledge that the chief ingredient of gall-stones (*viz.*, cholesterin) is soluble in chloroform and ether, both these drugs have been used internally, with a view of dissolving the stones. The idea is not bad, but unfortunately it has not proved a success; and if nowadays these means (*viz.*, ether combined with turpentine) are still used notwithstanding, they are done for other reasons at which I will scarcely hint. Durand's remedy may, at any rate, be reckoned among those that are efficient to some extent, and may be recommended in cases whenever it does not disagree. The same applies to other remedies which have been praised as specifics: euonymin, podophyllin, and calomel, which may certainly be helpful as cholagogues and drastics, but require great precaution and special consideration when being used.

The practical experience of centuries (which is certainly the best teacher), and theory as well, both put forward alkaline saline mineral waters in the treatment of cholelithiasis, and amongst these Carlsbad stands very prominently, a fact which needs no further proof. Under the influence of a Carlsbad treatment, continued long enough, stones usually pass off, provided they are not too large, and the bile returns to its normal quality, which, combined with the improvement in the general condition of the patient,

precludes any new formation of concretions. The Carlsbad treatment cures, at the same time, other pressing symptoms, and not only the possible catarrhal affections of the stomach and gut that may be present, but the tendency to manifestations of the uric acid diathesis (an almost regular companion of cholelithiasis) is relieved, the portal circulation is improved, the blood is purified, and the bile brought back to its normal condition. Whether such a thermal treatment is effected at Carlsbad, Marienbad, or Vichy, it is always of the utmost necessity to repeat the treatment several times so that one course shall immediately follow the other, as experience shows that a person suffering from gall-stones cannot be considered radically cured until he has been completely free from all symptoms for at least two years.

I consider it most important to here quote Naunyn's¹ words, who, by the way, is no optimist, but gives an opinion of Carlsbad based on his own observations over a large number of years. He says: "I have not the slightest doubt but that the Carlsbad cures have the best influence on the course of cholelithiasis. I have seen a considerable number of dangerous gall-stone incarcerations which had lasted a long time, end favourably. Patients evacuated the gall-stones with

¹ Naunyn, *l. c.*, p. 165.

attacks of only moderate intensity, and then I saw further relief follow and last over a number of years, so that a radical cure seemed indeed to have been obtained." I must also beg to refer to a letter sent from Carlsbad to Dr. E. Haffter, Frauenfeld, by the celebrated Swiss surgeon Professor Kocher. The said letter was published in the *Correspondenz Blatt für Schweizer Ärzte* (Nov. 28, 1893), and really deserves a wide circulation.

The use of Carlsbad water in cases of cholelithiasis has now become the household remedy of every physician, and naturally, as the majority of patients are not in a position to go to Carlsbad, they are bound to use the waters at home. If such a course is properly used and directed, it will meet with nearly the same amount of success as at Carlsbad itself. It does not matter which of the Carlsbad springs is ordered, as all are equal in the amount of salt they contain, but merely vary in temperature. Such a course at home ought to last over four to six weeks, and a bottle of Carlsbad mineral water ought to be drunk every day—viz., two tumblerfuls in the morning before breakfast, at intervals of fifteen minutes (warmed to temperature of 140° to 150° F., according to the taste of the patient); then in the evening, before going to bed, one tumblerful should be taken

cold (at the temperature of the room). Abundant action of the bowels must be obtained; and if the mineral water is not sufficient, five to ten grammes of Sprudel salt must be added to the water.

A well-regulated diet is essential in the treatment of all diseases, but especially of those which are based upon or accompany disturbances of alimentation such as cholelithiasis does. But even if we are in a position to give general rules for diet for this disease, we must modify them to each individual case; and here, too, the peculiarities of the individual, and the proper, right allowance both of quantity and quality of the food, are of utmost importance. A patient in failing health must be quite differently nourished from the vigorous or fat one; so also the young must be treated differently to the adults; besides which, the capacity for digestion and the event of complications of other illnesses are to be duly considered. The experienced physician must reckon how all these factors affect each particular case in order to be able to fix a régime of such a kind as will be useful to the patient, and not according to a particular scheme or plan. It is to be regretted that these circumstances are often not so carefully considered as they should be, and the good which proper treatment does to the principal malady is often impaired by rules of diet which are

either quite perverse or exceedingly severe. One of the most frequent and grave faults is the insufficient or improper feeding which patients suffering from gall-stones prefer to a well-regulated diet. Because attacks of colic so frequently occur just after meals (especially large meals of indigestible food), the daily allowance of food is cut so short that it is too large to be starvation diet, and too scanty to give sufficient nourishment. Or, which is quite as harmful, the patient is only allowed liquid food, whereby the dilatation of the stomach, which so frequently accompanies cholelithiasis, is further increased. It is true that the fault does not always lie with the physician, for I have often seen patients, fearing another attack, go below the limit of food ordered by the physician, and scarcely take half of the quantity which was allowed them. Now and then I myself am sometimes obliged to use all my authority, in order to convince many patients of this prejudice, and get them to take the amount of food ordered. Need I speak yet further of the consequences of an insufficient or faulty diet? Need I call particular attention to the fact that the patient, already run down in health by suffering and disturbances of digestion, will become still weaker by insufficient feeding? Need I prove that a faulty diet must increase the principal evil by causing still

further disturbances in the animal economy? I think this is hardly necessary, and the hints given will suffice.

As nearly as possible the best general régime would consist of nutritious, easily-digested food, offering the largest possible variety, and of such a quantity as may be suitable to the particular state of the sick person. The food should be given in small quantities at a time, but rather more often than usual. Mastication should be slowly and carefully performed, and not too much drink should be taken.

As a rule, I forbid fat, vinegar, hot spices, sweets, pastry, vegetables, both dried and unboiled, roasted potatoes, and cheese. For an ordinary case of cholelithiasis without any complication, I should recommend the following bill of fare:—

Breakfast.—A cup of tea or coffee, little milk, little sugar if any, and two or three pieces of rusk or toast. One or two soft-boiled eggs, or some fish or cold meat.

Mid-day meal.—Fish (salmon and eels excepted), roasted meat without sauce, green boiled vegetables or mashed potatoes, stewed fruits (without sugar).

Drink—plain or slightly effervescing water, red wine (one to two glasses) or weak whisky. Drinks containing too much carbonic acid gas are usually bad,

causing flatulency, and particularly distension of the stomach.

Supper.—Cold or hot meat (fresh roasted), tea, wine or whisky (small quantities).

I usually limit bread from four to six ounces daily.

With this diet excluding all harmful foods, a sufficient nourishment for patients is obtained.

To persons who are in very poor health I allow fresh butter; and where meat is not tolerated in sufficient quantity for nourishment, I add also rice and groats to the bill of fare. With the exception of a few cases, patients, during their stay at Carlsbad, adhere pretty strictly to the diet prescribed for them; firstly, probably on account of the well-known prejudice that an error in diet during the Carlsbad treatment may have the most serious consequences; and secondly, they find out how well they go on with a régime based on such rules. But how few have sufficient self-control and perseverance to continue such a diet for years; and yet this is an indispensable condition for perfect restoration to health, which means restoration of the bile to its normal state and keeping it in such condition. Only the family physicians can keep this limited diet up by energetic action, and they should under no circumstances grant any concessions.

Very much in the same category is another important line of treatment, viz., sufficient open-air exercise: here the physician is also bound to see that the patients spend at least two hours daily in the open air. As long as the invalids are in Carlsbad, they run about the whole day, and in many cases even do too much. But once home, they tend to get into their old paths, moving only so far as necessary, unless the physician energetically forces them to spend the time in the open air which is so much required. All bodily exercises as massage, swimming, riding on horseback, and Swedish gymnastics are naturally very useful as assisting vital processes, and should therefore be strongly recommended.

The treatment of biliary colic must necessarily be symptomatic. As long as the pains remain bearable, it is better to recommend an expectant treatment. All that can be done, or ought to be done, with any advantage, is to order an enema of glycerine by means of the Oitman syringe, in order to clear out the rectum; and to apply hot fomentations frequently to the abdomen. These compresses are better borne than heavy poultices or hot-water bottles, and very soon relieve any tension of the abdomen. But if the pains increase and come on in paroxysms, one must interfere at once, and in that respect I can by no means

approve of the *Laisser faire, laisser aller*. It is just the pains which pull the patient down most rapidly, and it is of the utmost necessity to spare and keep up his strength. The view that narcotics have ever stopped the passage of stones, or sent them back¹ to the gall-bladder, is entirely erroneous, and I am justified in this assertion by the number of stones which I have seen escape while the patient was under the direct influence of morphine or chloroform. As a matter of course, I have had during the last twenty-five years ample opportunity of using the whole series of remedies alluded to and recommended here, and I have finally come to the conclusion that there are but two sovereign remedies to which the symptoms respond in every respect—I mean morphia (given subcutaneously) and chloroform. The disadvantage of these remedies only comes out in cases where the physician trusts their administration to the nurse or the patient—an evil which cannot be too peremptorily guarded against. I only use chloroform in order to take away the pains if morphia is insufficient, or if there is idiosyncrasy against morphia, or in hypersensitive individuals with whom, in consequence of colic, convulsions may

¹ Stones can only, as a rule, glide back from the neck of the bladder, hardly ever from the cystic duct, and never from the common duct into the bladder.

easily come on. But, as a rule, I find that injections of morphia will suffice, and I have never experienced the disadvantages of it which some practitioners have pointed out. The great point is to keep the needle perfectly clean and free from rust, and to use as fresh a solution as possible for injection.

If severe nausea and violent retching come on, I order large quantities of tea or hot water with bicarbonate of soda to be taken, which causes vomiting immediately. But in most cases vomiting is spontaneous, and only requires medical interference when it is excessive and long-lasting. Ice to suck, ice-bag on stomach, and abstention from food for a given time are usually the best methods of relieving severe vomiting; and if collapse is threatening, iced champagne in very small quantities should be taken. The chief method in treating biliary colic is, unfortunately, still carried out by acting on the intestine, be it by purgatives, enemata, or so-called high injections; they are all useless, and the last three are directly injurious. Patients who have already had bad experiences of these methods may struggle against it, but mostly in vain. These circumstances then should induce the physicians in question to consider the value and admissibility of such prescriptions. Though the use of purgatives during an attack is an old one,

yet it is not good; they are usually vomited, and if they do no harm, they at least do no good. As long as the colic lasts the whole abdomen is spasmodically strained, there is almost entire cessation of peristalsis, gases develop abundantly, and rising upwards, distend the stomach, and it is with the utmost difficulty that the patient can get rid of them by evacuation per os, and almost never per anum. It is evident that under such circumstances the effect of enemas must be very doubtful, and that injections, sent high up into the gut, and still increasing its tension, must be directly harmful. Generally the water, too, is kept back, and what is not absorbed is passed when the fit is over. If, then, we are (after what has been said) on no account to irritate the intestine during a fit, it is, on the other hand, quite another thing to cause a free evacuation a few hours after the colic has ceased, and when the patient's strength is visibly restored. Oil (castor or olive) or Carlsbad salt dissolved in hot water answer the purpose best, and care must be taken to obtain daily defæcation.

Particular attention must be paid to any inflammatory symptoms in or around the liver, which sometimes develop during or after a long attack of colic, and require vigorous antiphlogistic treatment.

Patients who have to go through frequent and severe attacks of colic, especially if complicated by long-lasting jaundice, sometimes get so low that alarming symptoms of cardiac weakness come on, which can only be overcome by energetic use of tonics and stimulants. Happily such attacks of collapse are very rare, and only occur where stones make their passage from the bladder to the intestine under very aggravated circumstances.

Finally, a few words about Antipyrin, a remedy of recent date, originally accepted into pharmacy as an antipyretic, but which has since proved useful in nervous affections, and is prescribed now in cholelithiasis pretty frequently. For some years I used Antipyrin for different kinds of neuralgias, but especially in migraine, and with almost perpetual success. But I have used it also many times in biliary and renal colic, and have come to the following conclusions :—

- (1.) That it is entirely useless in renal colic.
- (2.) That it may shorten some cases of biliary colic, but only if taken promptly at the beginning of the fit, affording considerable relief by the profuse perspiration it causes.
- (3.) In cases where the fit has lasted a certain time (two to three hours) with violent paroxysms of

increasing intensity, Antipyrin does no good, and may even do harm, and from my own experiences I should earnestly warn people against the remedy in question.

Another important factor in the therapeutics is surgical interference not only in the complications and possible sequelæ (as perforation, peritonitis, cholecystitis, hydrops of gall-bladder, abscesses, fistulæ, intestinal obstruction caused by gall-stones, neoplasms, &c.), but even in cholelithiasis itself.

Surgical interference in cases of cholelithiasis has hitherto been less frequent than in cases of stones in bladder; but I am afraid that it will get quite as frequent, unless limited to cases of vital indication. It is true, in consequence of the high perfection to which the art of operating has been brought, and of the extensive precautions which are taken to prevent septic infection, that operations are attended with much less danger than formerly; but they are so far from being free from risk that a conscientious physician will carefully consider the circumstances and try all possible remedies before making his final appeal to surgery. The indications for operation laid down by Naunyn,¹ with which I fully agree, will certainly be accepted by all medical men; and, in

¹ Naunyn, *l. c.*, p. 170.

fact, Langenbuch, Körte, Fürbringer, Gersuni, and Leichtenstern share this point of view; whilst Riedl is of opinion that *all* cases of gall-stones ought to be operated upon, and the sooner the better.

But I am disposed to make a further advance and add two other indications:—

(1.) Cases in which fits of colic occur one after the other with great severity, and without any signs of evacuation of the stones. In such cases there is the danger of complete exhaustion supervening, which can only be prevented by performing cholecystotomy in time.

(2.) Cases in which a stone has been impacted in the ductus communis for a long time, provided the Carlsbad treatment has already been tried without success. Then the sooner the operation is performed the better chances will it have of success. If, however, in these cases the operation is delayed too long, and the patient rapidly loses flesh, or if he already is showing distinct symptoms of the evil effects of bile-absorption (in consequence of long-lasting jaundice), then, of course, the chances of operation are rather less favourable.

*ON THE SURGICAL TREATMENT OF GALL
STONES, AND THE COMPLICATIONS
ARISING FROM THEM*

By HENRY MORRIS, M.A., M.B., F.R.C.S.

SURGEON TO THE MIDDLESEX HOSPITAL, LONDON

THERE are many complications caused by gall-stones which demand immediate surgical treatment—such as abscess of the liver; abscess of the abdominal walls; intestinal obstruction from impaction of a large calculus in the small intestine; appendicitis, typhlitis, and perityphlitis, set up by ulceration or gangrene of the appendix or cæcum by a calculus lodged therein; and general peritonitis provoked by the rupture or perforation of the gall-bladder or common bile-duct. Such complications are, however, produced by various causes other than gall-stones; and as the indications for operative treatment are the same, no matter what may have been their cause, they do not need special description here. Thus, for example, when general peritonitis is excited by the rupture of a distended gall-bladder during an attack of biliary

colic, or by the sudden perforation of its walls by an ulcer, the urgency of the symptoms, the need of immediate operation, and the steps of the procedure are precisely the same as when a gastric ulcer has perforated, and led to extravasation of the contents of the stomach into the general peritoneal cavity. So in the case of intestinal obstruction, whether caused by a gall-stone or a foreign body swallowed. So, too, in appendicitis, whether due to a mass of fæces, a fruit-stone, or a biliary calculus impacted in it.

What require consideration in a treatise on gall-stones are the indications for surgical treatment which biliary calculi produce, either by their retention within, or by the effects of their transit along the biliary passages or gall-bladder.

These indications may be summed up under four headings—namely, tumours; abdominal pains more or less associated with gastric and intestinal disturbance; jaundice; and fistulæ. The chief surgical operations which have been devised for these troubles are four—namely, cholecystostomy, cholecystectomy, cholecystenterostomy, and choledocotomy. The only one of these, however, which is commonly required or performed is cholecystostomy: this is the operation of choice; the others should be undertaken only for

exceptional pathological conditions which very rarely can be ascertained until the surgeon is in the course of the operation. It will be convenient, therefore, first to describe the symptoms which make cholecystostomy expedient, and afterwards to enumerate the pathological states for which one of the other operations is best adapted.

It may be premised that cholecystostomy is one of the most successful of the operations of modern surgery. It is prominent amongst the most brilliant triumphs which mark the progress of the last eighteen years. Not that removal of gall-stones by means of a deliberate incision into the gall-bladder is an invention of recent times. It was clearly described, and distinctly advised in suitable cases, by Sharp of Guy's Hospital in the middle of last century. Within the first quarter of the present century, Bloch, with success, removed no fewer than sixty-two calculi in this manner from a patient's gall-bladder. Thudichum also, in 1859, urged the advisability of extracting gall-stones by incision.

It is, however, only since April 1878, when Marion Sims reintroduced the operation, and removed about sixty calculi and a quantity of fluid from the gall-bladder of a patient whose biliary ducts and tubes were gorged and sacculated with bile, that the

operation of cholecystostomy has found favour with surgeons.

Before this date the marked success of the early ovariologists had rendered the surgical mind ripe to extend in other fields the conquest made in this. At this period, too, the teaching and practice of Lister began to impress very deeply the mind of the whole profession; and surgeons, whether or not they accepted the Listerian doctrines in their entirety, became nevertheless imbued with the importance of exercising the strictest precautions as to cleanliness in every detail of the technique of operations. The fear with which wounds of the peritoneum had formerly been regarded, thus rapidly passed away as success became more and more assured; and as a consequence of this, many operations—cholecystostomy amongst them—which the ingenuity of our ancestors had proposed, and their skill had occasionally put into successful practice, but which did not take root in the surgical mind of the period, at length acquired a recognised position in surgery, to the honour of the profession, the relief of suffering, and the benefit of humanity.

The symptoms to which gall-stones give rise differ somewhat with their size, shape, and number; more with the part of the gall-passages in which they

become impacted; and more still upon whether or not the biliary passages are in a state of inflammation.

It must be borne in mind that biliary calculi may be formed wherever the bile becomes stationary, and consequently they are found not only in the gall-bladder and larger biliary ducts, but also in the very small tubes in the liver itself.

A gall-stone may migrate from the smaller to the large ducts, and at length reach the duodenum. During its transit it may cause temporary enlargement of the liver, congestive swelling of the ducts, and the local pain and general reflex symptoms which are signified under the term hepatic or biliary colic. Still, relief comes as soon as the stone reaches the bowel, and this it very frequently does under medical treatment, and without the intervention of surgical assistance.

But if the calculus becomes arrested in either the hepatic, cystic, or common bile-duct, it causes congestion of the liver and distension of the bile-ducts, attended by pain, jaundice, or enlargement of the gall-bladder.

If the impacted stone induces œdema, bruising, or ulceration, septic infection by micro-organism occurs in the damaged part, and inflammation or suppuration, as well as distension, of the biliary passages is the result.

Normal bile is aseptic; but bile which is altered in its chemical composition by alcohol or other blood poisons, or is pent up in biliary passages which have been damaged, is not so. Under any of these circumstances the gall-bladder, bile-ducts, and even the substance of the liver, may be invaded by some of the numerous bacteria which are known to infest the duodenum—especially by the *bacterium coli commune*—and thus cholecystitis, empyema of the gall-bladder, and abscess of the liver are caused.

It has been stated above that the indications for an operation for gall-stones are the presence of a tumour, pain, jaundice, and a persisting biliary fistula. These indications may exist separately, or all together, or in very varying combination. Thus in one case there will be a tumour alone; in another, a tumour with pain but without jaundice; in a third, pain and jaundice without a tumour; in a fourth, only attacks of biliary colic, with perhaps the history of having passed one or more gall-stones; in a fifth, an attack of biliary colic and jaundice may have passed off, but only to be followed by a tumour and recurrent seizures of colic or jaundice, or both; and in still yet another class of cases the tumour may vary in size, or disappear, or become inflamed, and if inflamed, adhesions may form with the parts

around, and give rise to distressing symptoms long after the gall-stones have escaped and the gall-bladder has shrunk to a size no larger than the little finger.

Tumour formed by the gall-bladder.—When aseptic bile is retained in the gall-bladder, an active secretion of mucus is apt to occur and increase the distension, and the condition known as dropsy of the gall-bladder is the result. Such a tumour in many persons spontaneously disappears sooner or later without having caused any marked distress; but if it persists, and especially if it causes pain, owing to tension or dragging effects, or if it excites reflex symptoms, it ought to be submitted to operation. But an additional reason for surgical intervention is found in the risk which is run of inflammation, suppuration (empyema), or perforation of the gall-bladder supervening. If only the mildest of these complications, namely, cholecystitis, occurs, the after consequences may be very serious, because of adhesions formed between the gall-bladder and the stomach, or duodenum, colon, omentum, right kidney, or the abdominal parietes. Other consequences still may happen if relief is not given by operation—such as a biliary fistula, a localised peritoneal abscess, or death from cholæmia or uræmia. On the other

hand, a timely operation will lead to a successful extraction of the impacted calculus, and will thus prevent the formation of a permanent cicatricial stricture of one of the ducts, or of any of the other complications just enumerated.

Dropsy of the gall-bladder gives rise to a tumour in the right hypochondrium projecting below the edge of the liver; dull on percussion; well defined, and regularly rounded, or pyriform or elongated in shape; elastic, tense, and rarely fluctuating. It is in some cases of stony hardness, and may yield a grating sensation. The size of the tumour is very variable, being in some cases that of a walnut, in others that of a lemon or a cocoa-nut, and in others much the shape and size of a sausage. It may only just project beyond the false ribs, or it may extend below the anterior extremity of the twelfth rib, or reach to the iliac fossa, or be depressed towards the loin so as to be mistaken for a renal swelling. It is mobile, often freely so, its lower extremity moving in the arc of a circle around its upper end. It usually tends to increase downwards and inwards towards the umbilicus, and it may often be moved in a lateral direction, very freely indeed. It descends on respiration with the liver. It is in some cases visible to the eye immediately on exposing

the abdomen, and I have seen it so prominent as to project the abdominal walls in a very marked degree, looking like a large pear-shaped body standing forward beneath the abdominal walls. It is but little painful, or tender, even to free manipulation, and it is sometimes quite unattended by functional or reflex disturbance of any kind.

On percussion, if a resonant note is elicited, this is due either to a piece of bowel riding in front of, or to the presence of a coil of bowel immediately underneath it.

If the liver has been displaced or distorted by tight lacing, the tumour, instead of being prominent to the eye, or to palpation of the front of the abdomen, may be tilted backwards towards the loin, and is then very likely to be mistaken for a renal tumour.

A tumour may be present though it cannot be detected either by the eye or by palpation. I have operated upon a woman because of constant abdominal pain and frequent attacks of jaundice, whose gall-bladder was distended to the size of a large pear by three large stones and a quantity of bile, and yet a tumour was not revealed until the peritoneal cavity was opened and the fingers introduced.

In a large-framed person with a roomy abdomen

and fat parietes, such a tumour may easily be overlooked or be clinically undetectable. It may drop backwards towards the loin through its weight, and the colon or small intestine may ride in front of it. I have known a large sausage-shaped gall-bladder in a state of empyema, bound down towards the loin by coils of intestine firmly adherent over the front of it. I have twice exposed an enlarged gall-bladder through an incision in the loin; and once detected a stone in the cystic duct when fixing a movable kidney. In some cases the tumour undergoes great variations in size, increasing and diminishing, or disappearing entirely.

When its contents are completely or nearly completely absorbed, the walls of the gall-bladder contract, and become tough and thick, or even calcareous, so that it is shrivelled up beneath the edge of the liver; in some such cases jaundice is present, owing to persistent obstruction in the hepatic or common bile-duct. These cases are the most unfavourable for operation, and yet if left alone the patients must die from cholæmia, or uræmia, or supuration along the course of the ducts, or from emaciation and debility.

The tumour caused by *empyema of the gall-bladder* is associated with high temperature, rigors, acute pain

at the seat of the swelling, and often with great increase, from congestion and biliary distension, in the volume of the liver. If these tumours are not relieved by operation they are almost sure to end in perforation or rupture of the gall-bladder, and thus to excite either acute general or subacute localised peritonitis. Localised peritonitis may lead to the establishment of a circumscribed cavity containing pus, or bile, or calculus concretions; and the walls of the cavity may be formed by the liver, gall-bladder, stomach, small intestines, colon, or any of the neighbouring organs or structures. In such cases the contents having escaped from its interior, the cystic tumour loses its outline, and the gall-bladder may contract down to very small dimensions. I have operated upon two ladies, each of whom had a distinct history of biliary calculi and of a cystic tumour; in each case the gall-bladder had contracted down to a very small size after having suppurated and perforated; and in each, biliary calculi were removed from between the gall-bladder and the stomach, which had become very firmly bound together by tough adhesions. In both cases the immediate symptoms which caused the patients to seek surgical relief had reference to the stomach, and were immediately and permanently relieved by the operation.

It must not be supposed that in every case of distension of the gall-bladder requiring surgical treatment a gall-stone will be found at the operation. Cholecystic dropsy, empyema, or accumulation of bile within the gall-bladder, are produced by causes other than biliary calculi. Persistent œdema of the walls of the bile-ducts, inflammatory or cicatricial stricture of the ducts, and distortion or occlusion due to adhesions, as well as growths of the gall-bladder, of the pancreas or stomach, are all responsible for these conditions. Great relief is often afforded by cholecystostomy to patients whose primary disease is even of a malignant nature.

Pain.—Abdominal pain, situated especially in the right hypochondriac and epigastric regions, if of a permanent character, occurring in a person who has passed gall-stones, or had jaundice or hepatic colic, some little time prior to the establishment of the pain, is a sufficient reason for performing an exploratory laparotomy with a view to an operation on the biliary passages. The persistent pain complained of may be associated with occasional sickness, gastric flatulence and distension, loss of appetite, constipation, and emaciation; and it may or may not be aggravated by intermittent attacks of biliary colic or jaundice.

The cause of the pain may be reflex, and due to the constant irritation by an impacted calculus; or it may be due to the dragging effect of adhesions on the stomach, duodenum, colon, omentum, or other part. Such cases can generally be completely cured by operation—removing the calculus, or dividing the adhesions as the circumstances require.

Jaundice.—Jaundice is an indication of obstruction in the hepatic or common bile-duct. It is often unassociated with a cystic tumour, which is more frequently caused by an obstruction at the orifice of the gall-bladder or in the cystic duct than by a blocking in the common bile-duct. When jaundice persists, it gives rise to itching, and a yellow colour, and often even an olive-green hue, of the skin; nausea, dyspepsia, loss of appetite, constipation, emaciation, loss of strength, and cholæmia, together with all the other symptoms and changes in the excreta which accompany jaundice from other causes, are also induced. Inflammatory affections and abscess of the liver are occasional complications of such cases. Jaundice persisting for some weeks is of itself a sufficient reason for an exploratory operation; and if not of very long duration, and the cause of obstruction is found and removed, such cases do very well.

In some instances in which there is no tumour there is pain and jaundice without any distinct indication of their cause; in others the presence of calculi is established by recurrent violent colic, which resist every kind of medicinal and dietetic treatment.

Jaundice is sometimes the only symptom present. As these sheets are going through the press I have under treatment a gentleman at sixty-nine who has had deepening jaundice of six months' standing without pain, tumour, or vomiting; and within twenty-four hours after cholecystostomy and the extraction of forty-three stone, his stool contained bile.

There are several cases on record to prove that where pain alone, or pain with jaundice, has reduced patients to the verge of suicide or death, laparotomy and digital examination of the liver and gall-ducts have restored the sufferers to complete good health, though no tumour or gall-stones have been found to account for the symptoms. In a case of the sort upon which I operated, the liver was enormously enlarged from simple congestion, and part of its convex surface was adherent to the anterior parietal peritoneum; all that was done was to separate the adhesions, and within a few hours the liver had contracted to its natural size, and within a week or

so the patient was quite recovered, and has remained well since. In some cases a localised congestion at the seat of pain, in others a general enlargement of the liver due to engorgement of the biliary ducts of unascertainable cause, have been completely cured by laparotomy. Such cases are parallel with those in which complete relief from all the symptoms of renal calculus has followed a negative exploration of the kidney for stone.

Biliary Fistulæ.—Biliary fistula may be the result either of a surgical operation or an abscess. Fistulæ which open on the surface of the body are the only ones which require surgical interference. The most usual place of opening is between the margin of the ninth rib and the umbilicus. Frequently those which follow a biliary abscess in the abdominal walls open spontaneously in precisely the spot at which a cholecystostomy is established by the surgeon. In other cases the contents of the cystic swelling spread between the layers of the abdominal walls, and burst externally a very long way from the hepatic area. The track of the fistula is usually irregular and indirect. What escapes from these fistulæ may be either bile, pus, mucus, or calculi. The fluid is sometimes very offensive; calculi sometimes imbed themselves subcutaneously, just beneath the external opening of the fistula. The skin around

the orifice is often greatly irritated by contact with the bile, so that excoriation, ulceration, gangrene, or erysipelas are caused. Severe constitutional symptoms may result from the continued escape of bile, such as vomiting, hectic fever, marasmus, &c.

If a fistula which follows a biliary abscess is kept open by gall-stones retained in the gall-bladder, the proper treatment is to enlarge the opening in the bladder and remove the stones. If the cystic or common duct remains blocked by a calculus, the general abdominal cavity must be opened, and the calculus removed by an incision through the wall of the duct, if it cannot be pressed back into the gall-bladder.

I operated a year or two ago on an elderly man from whom several small stones had escaped through a fistula, established after the bursting of a biliary abscess in the right hypochondrium. He was much inconvenienced by pain and discharge, and was rapidly losing flesh and becoming jaundiced. I enlarged the fistulous opening and removed several small calculi from the gall-bladder, and extended the incision downwards till the peritoneal cavity was opened. With my finger and thumb I tried to squeeze and press onwards other stones in the common duct, but could not do so. During his convalescence olive-oil was daily

injected into the gall-passages through the fistulous opening; and in the course of six or eight weeks the biliary passages became quite patent, the fistula closed, and the patient got quite well, and remains so at the present time.

When a fistula following an operation has to be closed, it is best treated by freely freshening the edges and bringing them together by deep sutures. If the patient declines an operation, and there is much bile daily escaping, a receptacle, very like that made for me years ago for patients with urinary fistula in the loin, can be worn with great convenience and comfort. A fact which experience has impressed on me is that the escape of bile is most free when the stomach is empty, and especially in the early morning, and that this escape is greatly diminished if the patient takes breakfast before rising.

It would be out of place here to enter into a description of the technique of the operations on the gall-bladder and ducts, nor am I now concerned to discuss the relative values of the different methods of performing the different operations. I will therefore conclude this summary of the operative treatment of gall-stones with a few words upon the clinical and pathological conditions which should determine the adoption of one operation rather than the others.

Aspiration and puncture with trocar and cannula in my opinion ought never to be done. Unless the gall-bladder is already adherent to the parietes it is *dangerous*, because of the risk of puncturing a blood-vessel, or of the escape of the contents of the tumour into the peritoneal cavity on withdrawing the instrument. It may mislead us even in forming a diagnosis, because the fluid which sometimes is withdrawn from a distended gall-bladder is very like hydatid fluid, or altered blood, or pus, and not at all like bile. Neither is the readiness with which an aspiratory puncture can be made always in favour of the patient. A little delay is sometimes advantageous. Many years ago I was asked to see a patient in one of the medical wards of my hospital, with a view to aspirating an abdominal tumour. After examining the case, I expressed the opinion that the tumour was an enlarged gall-bladder, and that it had best not be tapped through the abdominal wall. Before arrangements could be made for an exploratory laparotomy the tumour had spontaneously disappeared, and the man subsequently left the hospital quite well.

If, after the failure of dietetic and medicinal treatment, combined with gentle massage of the surface of the abdomen, the tumour still persists, an exploratory laparotomy ought to be performed. It is

much safer than aspiration, and affords the opportunity of making a positive diagnosis, which aspiration does not do.

In the great majority of cases *cholecystostomy* will be the operation requisite.

If the cystic duct is *permanently* occluded, cholecystectomy (removal of the gall-bladder) is the operation best suited for the case; but if there is the very least chance of the permeability becoming subsequently established, cholecystostomy is much to be preferred. Obstruction from gall-stones, strictures, and adhesions will sometimes right itself after the gall-bladder has been opened, and stitched to the parietal peritoneum.

There are two ways of dealing with the incised gall-bladder after emptying it of its contents. The ideally perfect, but practically not the safest and best method is to close the opening by Lembert's sutures, and drop the gall-bladder back free into the peritoneal cavity. This is *cholecystotomy*. The other way is to stitch the cut edges of the gall-bladder to the cut edges of the divided parietal peritoneum. This is *cholecystostomy*.

When the gall-bladder is the seat of malignant disease, or its walls much diseased by inflammatory changes, *cholecystectomy* is the proper operation, pro-

vided the whole of the diseased parts can be removed, and the common duct is patent.

If the common bile-duct is permanently occluded, *cholecystenterostomy* should be performed if the gall-bladder walls are healthy; if not, an external fistula should be established so as to prevent death from cholæmia. Cholecystenterostomy may then be possible at a later period.

If the cystic and common ducts are simultaneously occluded, the outlook is most unfavourable. When impacted calculi are the cause of obstruction, the best course is to extract them, if possible, through an incision in the walls of the ducts (*choledocotomy*), and then suture the opening.

If the occlusion is due to stricture, and the bile-duct above the obstruction is much dilated, *choledocoenterostomy* may be possible, as in a case treated by Sprengel. This will, however, be but very rarely practicable.

PART II

VII

CASES

I.—Cholelithiasis of long standing—Evacuation of both old and recently formed Stones during Treatment at Carlsbad—Improvement.

MRS. L. H., wife of a large landowner in Silesia, consulted me for the first time in the month of October 1880. Being very deaf, she gave me an account of her sufferings, written by herself, of which I give an extract here.

The lady, aged 50, was of healthy family, of lively disposition, and with the exception of a few maladies of childhood, always had good health. Married at 23, and had 10 children in 16 years—normal deliveries. She was always inclined to be constipated, without taking much notice of it or using remedies. In 1873 she first felt generally ill, without complaining of any special symptoms. The physicians supposed it to be

due to nervousness, and sent her to Landeck, which improved her. As she returned home, the old troubles returned, and, in addition, the abdomen began to swell, and was very sensitive to pressure, especially below the ribs, so that the act of bowing caused her great pain. Passing wind caused mitigation of the pains. The constipation gradually got worse, and she began to take purgatives. In 1875 she was sent to Carlsbad, but was only able to undergo treatment for a short time; but even then she felt a little better. The constipation continued; but pains which were generalised over the abdomen became more localised in the region of the stomach and liver, and began to occur paroxysmally. Could on no account ride in a carriage, as attacks came on immediately after. In March 1878 she was again sent to Carlsbad, and is said to have been treated for flatulency. She improved under treatment, but was nevertheless advised to go to Landeck to be braced up. While there, she for the first time got true attacks of colic, said by the physician there to be spasm of the stomach, and the fits were often repeated. Returning home, she became very ill for ten weeks, but did not know the nature of the illness. Nor could the physicians agree about her illness, and leeches were frequently applied to cure the fits, which

had again become frequent. Was obliged to take a lot of medicines; could not eat nor sleep; in a word, she spent a miserable life (*ipsissima verba*). Up to that time the physicians did not think of gall-stones, or, at least, no statement had been made to her about it. In August 1879 she went again to Landeck, where, a few days after her arrival, she got a very violent attack followed by jaundice, and then the physician declared the disease which had been previously diagnosed as spasm of the stomach to be gall-stones. Several doctors who were consulted confirmed this diagnosis, and advised Carlsbad treatment, in spite of the season being far advanced. But the patient was in such bad health that a rest at home seemed to be the first necessity, and until Christmas she went on pretty well; but in the beginning of January 1880 attacks of colic became still more vehement, followed each time by jaundice. In February of the same year she went to Berlin to consult Professor Frerichs, who also diagnosed gall-stones, but warned her against Carlsbad, presumably on account of great weakness and nervousness of the patient. He advised her to eat more, and gave her pills which did decidedly well for some time (till beginning of May). From May onwards colics became again more frequent and violent.

Frerichs' pills were of no use, and morphia injections, then begun, were the only measures which took away the pain and rendered life tolerable. The physician treating her insisted on Carlsbad as being the only place at which she could really be cured if a cure was still possible. In spite of all that, she still hesitated, and became naturally weaker and more miserable, until finally, notwithstanding the opposition of her relations, she declared that under all circumstances she would follow the advice of her family physician, and, as already stated, she came late in the autumn of 1880 to Carlsbad to be treated by me.

When I first saw the patient I could not help thinking I had a fatal case before me. The sallow grey complexion with great emaciation made up a painful combination. Hardly any appetite existed, and anything that was taken was vomited almost immediately afterwards. Skimmed milk, groats or rice boiled in milk, was best kept down, but even these were sometimes vomited. No defæcation for five days, little sleep, increased thirst, urine scanty, with copious deposits of lithates stained with bile pigment. Lungs and heart normal. Heart sounds clear but weak. Abdomen a little contracted, curved, and so sensitive that I was obliged to get it rubbed with

chloroform oil before making a close examination. I found the liver fairly enlarged and very sensitive in the region of the gall-bladder. Spleen normal. In the intestinal tract, in sundry places, especially in the flexures of the colon, hard tumours could be felt, which I took for scybala. In commencing treatment, my first object was to cure digestive disturbances, to relieve the intestines, and to increase the appetite. Under the circumstances no radical mineral water treatment was to be thought of, and, *nolens volens*, I was obliged to try drugs. The patient, who at first was unable to leave her room, was given half a glass of Schlossbrunnen three times a day, an injection of one litre of lukewarm Schlossbrunnen twice a day, with ten drops of tincture of belladonna. For two hours daily hot mud poultices on the abdomen; after every meal, dil. hydrochloric acid and pepsin, and in the evening a rhubarb capsule (containing pulv. rad. rhei. chin. 0·50, sod. bicarb. 0·20, extract. belladonn. 0·01). For the first two days there was no evacuation, thus making altogether seven days since anything passed. The injections were not retained; the pure water nearly all came back, and was of a feculent colour. But at last a quantity of flatus was passed, affording a certain amount of relief, although not much, to the

patient, and the general condition had become, if not better, certainly not worse. On the third day some small pieces enveloped in ragged slime passed away, soon followed by more of larger size, and on the sixth day a hard feculent mass was passed of about 4 to 5 cms. in diameter, with great pain, and immediately after about half a coffee-cupful of bloody slime-rags of pack-thread shape. Though the patient was much affected by this large loss, and for the moment felt like swooning, still she soon recovered, felt easier, and had for the first time several hours' good sleep the following night. Nevertheless, attacks of colic came on almost daily, and most of them so severe as to require injections of morphia. Stones were never found in the evacuations, which were now passing pretty freely, although they were carefully looked for. In the meantime (in the course of the second week, patient could already take more mineral water—three cups daily) the injections were only given once a day; dil. hyd. acid and pepsin given up; appetite improved, and patient could already eat raw ham and scraped meat without vomiting it. As a result of improved nutrition and better and quieter sleep, her strength had improved so much that she could take longer walks, although she always felt some pain. Towards the end of the third week,

however, fits of colic became more frequent and intense, reducing the patient so much that she lost nearly all her appetite, and was obliged to keep in bed. Troublesome itching also accompanied the jaundice, and, as a consequence of this, sleeplessness came on. The general condition of the patient was at the beginning of the fourth week nearly as bad as when she arrived at Carlsbad. On the twenty-fourth day of treatment the colics and exhaustion had advanced to such a degree that I began to seriously fear for her life. Neither morphia nor chloroform relieved the pains for any length of time, and I was obliged to give up using them, and to begin strong stimulants, as the patient repeatedly had collapses. These pains with vomiting went on, defying all remedies, for sixteen hours, and then suddenly ceased, and though there was yet some danger from the extreme weakness, I still hoped with good fortune to be able to pull the patient through; and indeed, with great care, she recovered much more rapidly than could have been expected.

Action of the bowels again very defective lately, and in the last forty-eight hours entirely wanting; no action occurred spontaneously for the next three days, and I did not think it advisable to interfere, considering the great weakness of the patient. It

was not until the fourth day, and after the patient had slept well the night before, that I gave her a dose of castor oil; and seeing no signs of any result after eight hours, I ordered an enema. With the water there came away several small hard nodules of fæces, faintly tinged with bile, and also a large quantity of flatus. A search for stones amongst these lumps met with no result. The next (fifth) day a copious pap-like evacuation, deeply stained with bile, occurred spontaneously, wherein I found three stones, each almost as large as a hazel-nut, of dark brown colour and mulberry form, and several smaller ones, which were evidently recent, about the size of hemp-seeds; they were of a pyramidal shape, pearly grey colour, rather soft, and composed almost exclusively of cholesterolin. I continued to examine the fæces for several days, and each time I found several small stones of that same kind, but I never again found a large one like I did on the first day. On the eighth day the patient got out of bed, and a few days later she could already take walks in the open air. The icterus had entirely disappeared, appetite and sleep kept improving, strength increased from day to day, and after three weeks' further treatment I was able to discharge her as essentially better, and with an increase in weight of three kilos. Until February 1881 she

kept quite well; she had nothing to complain of except constipation, against which, from time to time, the use of rhubarb and enemas had some effect. On the 20th of February she suddenly got (in consequence of great mental worry, as she believes) a very severe colic, which she says was accompanied by symptoms as severe as the last at Carlsbad, but it only lasted eight hours. Morphia was not injected, as no physician could be obtained in time. The next day jaundice came on, and lasted about five days. The stool was not examined for concretions, and recovery took place pretty quickly.

In the beginning of April 1881 the lady came again to Carlsbad, and underwent continuous treatment for four weeks without interruption, and, as I believed, with great success. Later on she went to Landeck, and had several slight attacks there, such as had been taken for cardialgia before. She therefore came in the month of October of the same year to Carlsbad, where she again underwent three weeks' treatment without any disturbance. Acting under my special wish, she has undergone treatment twice more since then, viz., in 1882 and 1883. She has never been to Carlsbad since, and is, as I often hear, quite well. I have recounted this case at rather

great length, because it shows a complete picture of cholelithiasis and the symptoms attending it.

We see, in the etiology of this case, habitual constipation and frequent pregnancies. We see the prodromal stage, which began with general troubles, showing gradually more typical symptoms, and passing after about two years into the actual state of cholelithiasis. We see how the malady is originally wrongly diagnosed and treated in a corresponding manner, until a typical attack followed by jaundice leads to a rectification of diagnosis and treatment. We see the wearisome course and its unavoidable consequences and gradual decay of strength, until finally we see how, by a specially severe attack, the impulsive forces overcome the natural resistance and render the evacuation of stones possible. So, also, we may learn many other things from this case which scarcely need specially pointing out.

II.—Diabetes and Cholelithiasis.

“CARLSBAD, *May* 19, 1885.

“I am in my 61st year, have suffered, during the period of my studies, from chronic infiltration of the apex of the right lung, pleurisy with exudation on the right side, and from typhoid; but during the time

I have practised as a physician, and so had bodily exercise, I have always been in good health. Early in 1877, having undergone great physical and mental strain, in consequence of a fellow-physician (Dr. T.) being ill, I fell ill with diabetes. Unusual dryness of the throat, thirst, and weakness of the lower extremities were the chief symptoms of my disease. The urine caused white spots on the deal boards of the floor and on the trousers; it was excreted in enormous quantities, and on examination was found to contain about 4 per cent. of sugar. All foods containing sugar or starch were given up at once; the sugar disappeared in two days, and all signs of the disease ceased, with the exception of weakness of the lower extremities. The smallest deviation from a strict diet caused traces of sugar to at once appear in the urine up to 1 per cent. In 1878, on account of weakness in the feet, combined with general relaxation and feebleness, I took the waters at Carlsbad, which, however, produced no essential change either. A certain time afterwards I felt very much worse; sugar always returned after taking substances which did not agree with me. Increasing fatigue and more work compelled me in 1882 to make all my visits in the town in a vehicle, and since then I have quite given up walking. In December 1884 the appetite, which till

then had been good, considerably decreased. On December 11, at 4 A.M., a violent rigor lasting three hours woke me up; headache and general aching all over followed, as well as continual eructations, general malaise, heartburn, acute tension in the region of the stomach, so that I could not stay in bed with it. After getting up, the symptoms rapidly decreased; moderate rise of temperature, some quickening of the pulse, great relaxation and absence of appetite followed. About noon the urine was of a dark brownish-red colour; but towards evening I slept well and for a long time, and felt well again. The urine again became light yellow. On December 14 I went to bed quite well, but after sleeping for half an hour was needlessly bothered by a patient, which made me so angry that I could not get to sleep again. Got violent eructations, with pains in the stomach and back, and after three hours I could not bear it in bed any longer. I got up and walked about, but for an hour there was no relief, and then the symptoms suddenly ceased. There was no fever this time, and consequently less faintness, so that I was able to do my work the next day. Towards noon the urine got brownish-red again, and the stools were of a light colour, and itching with a slight icteric tinge of the skin occurred. These symptoms disappeared in a few

days; but the loss of appetite, however, had now become continuous. On January 6, 1885, having freely partaken of supper the previous evening, I awoke at 6 A.M. with violent pains and tension in the stomach. These pains extended over the chest, but did not reach the back, and again I had the most troublesome eructation and feeling of illness into the bargain.

"By introducing a finger into my throat, I made myself vomit, and with this action all the symptoms disappeared as by enchantment, though some small quantity of sour slime was evacuated. The fit had lasted one hour and a quarter. I laid myself on the sofa quite fatigued, awoke after half an hour's sleep with a chill which lasted two hours, temperature reaching about 38° C. Felt faint also. All these symptoms passed away in three days.

"On February 7, after a country drive in a bad carriage and over rough roads, I had continual sleeplessness with perpetual sour eructations, but little abdominal pain, and very little fever, so that I was able to attend a midwifery case at four o'clock in the morning. This fit passed off without jaundice; but on the next day I experienced what I had not done before, viz., continuous pains in the lower part of the left side of the abdomen, which, though mitigated

by eructations, extended in slight degree on the third day over the whole abdomen.

“On June 27 all these troubles had disappeared.

“The following night I was much disturbed by excessive quantity of urine and marked dryness of the mouth; but on examination the next morning the urine showed but a very slight reaction of sugar. Till then, on account of my failing appetite, which had now gone on for many weeks, I had taken a good deal of starch in a fluid form, viz., cocoa, egg-beer, beer with triturated bread and sugar. Fearing that the diabetes, in spite of the small quantity of sugar in the urine, might increase again, I returned, from June 25, to a strict meat régime. The effect of this was very striking. While on June 25 I could only take meat reluctantly, on the 26th I had already a good appetite; after a few days it became surprisingly strong; body-weight, having dropped to 135 lbs., increased rapidly, as well as the body circumference, till, on July 30, I weighed 156 lbs., *i.e.*, an increase of 21 lbs.; face has become considerably more healthy-looking; strength as good as before illness, and no trace of colic or rigor for these four and a half weeks. Since July 20 I have resumed work on a very large scale, and have also taken starchy food and fresh fruits for several weeks,

always, however, combined with a large proportion of meat and eggs.

“This illness is as interesting as it is difficult to comprehend, on account of the complication of slight diabetes with chronic troubles of digestion, and attacks of colic showing the presence of gall-stones. That the diabetes has already existed eight years, without any great disadvantage to my health and working capacity, is nothing extraordinary after numerous experiences of similar cases; it is evidently the consequence of a functional disturbance of the liver, and probably of its structure as well, inasmuch as symptoms of diseased liver, but no changes in the nervous system, have occurred in the course of the disease with me. It is very remarkable that when emaciation (in consequence of biliary colics) had reached its highest pitch, even abundance of starch and sugar caused no trace of sugar in the urine or any other diabetic symptoms; whilst after recovery and increase of body-weight had taken place, diabetes reappeared as before. It is a well-known fact that diabetes occurs most in fat people; but ignorant as we are of the exact causes of getting fat, as well as the causes of diabetes, it can hardly be decided whether in my case diabetes ceased in consequence of disappearance of fat, or in consequence of a change in

the function of the liver produced by frequent biliary colic. Diabetes is a complication of some rarity with such particular disturbances of digestion and attacks of colic as have occurred with me since 1884. Moreover, besides the typical symptoms of gall-stones, were others which, at any rate, are very rarely found to follow an attack, and amongst these may be mentioned the intense fits of shivering lasting sometimes whole hours, not occurring, as described by authors, at the height of the fit, but after the pains had ceased, or alternating with the pains, and sometimes even quite independently, without any connection with the fit of colic. The course of the disease proves that these rigors cannot be put down to abscesses of the liver, as was suggested by one of my fellow-practitioners. It is, however, difficult to find any satisfactory explanation for them; the most probable supposition is, that they are produced by the transition of bile ingredients into the blood. What is still remarkable is the occurrence of fits decidedly of the biliary colic type alongside others which, in spite of a strong resemblance to the first, ought to be designated as *colica flatulenta*. This may be accounted for by supposing that the former are due to passing gall-stones, and the latter by accumulation of gas in the intestines in consequence of contemporary gastro-duodenal catarrh.

"The frequent return and the short duration of colics prove that the stones existed in large number, but were of such small size that no great obstacle was offered to them passing through the ducts.

On the 17th February, at 3 A.M., I awoke with a well-marked rigor and severe aching pains extending all over my limbs and drawing them up, but no stomach trouble; on the contrary, after three hours' fever I was very hungry. In the afternoon I was still feverish, with a pulse of 100, and had a jaundiced skin and reddish-brown urine. On 18th February I was quite well, and energetic, and actively working at my practice. These fits were similarly repeated, almost without exception in the night, on 25th and 28th of February, on 5th, 9th, 13th, 18th, 25th, and 28th of March, on the 4th, 5th, and 6th of April; which partly consisted of gastric disturbances, such as continual eructations connected with violent pains in the stomach region, and partly of rigors with fever. There were severe attacks of colic without any fever, and attacks of fever without colic, lasting from three to five hours; but in all cases there followed the icteric skin colour, itching, icteric urine, and greyish-yellow stool. Most fits were due to a fault in régime, a cold, or extraordinary exertion; but in some of them none of these causes could be proved.

“ During the course of the illness the appetite always got smaller; strength and body-weight decreased, weight falling from 176 to 149 lbs.; itching occurred, and was accompanied by sleeplessness. The jaundiced skin, brown urine, and light-coloured stool by-and-by became continuous, and in this state I went on 25th of April to Carlsbad. Let me add that since the middle of March I had again been taking starchy and sugary foods, especially milk and biscuits, but there was no return of the former reaction of the urine for sugar, and no symptoms of diabetes occurred afterwards. Therefore I almost entirely changed my meat diet which I had kept since 1877, for one containing far more carbo-hydrates. After my arrival at Carlsbad, Dr. K. examined me, and said that there was an enlargement of the left lobe of the liver; sensibility increased over a small part in the epigastrium on the right side of the end of the sternum and extending along the arch of the ribs on the right side; no fever; bile pigment in the urine, but neither albumen nor sugar. For the first nine days splendid spring weather favoured the effects of treatment. Very soon strength, appetite, and general condition all improved, while the jaundice considerably decreased; but still the former attack of the disease did not even disappear at Carlsbad. On the 27th of April I had, immediately after

getting up, a violent rigor for half an hour without any colic; and during the night between the 3rd and 4th of May I had rigors and stiffening of the limbs, and passed nearly two litres of bright yellow urine, with pains in the urethra and the bladder, but there was no sugar in the urine. On the 4th of May, in the afternoon, the urine became red-brown again, and in this attack no colic occurred, but came on with the next fit during the night of 7th to 8th of May, giving rise to violent pains in the pit of the stomach, which lasted half an hour, and were accompanied by eructation and vomiting, and then an hour's chill; stool in the day was of bluish-green colour, and the urine red-brown. On May 17 the most violent fit I had ever had began in the forenoon at 10.30 A.M., with most violent pains in the region of the stomach, and from there radiating to the chest and back. After one and a half hour's vomiting there were remissions of pains; but then a strong rigor of one hour's duration occurred, succeeded again by violent pains, which were subdued by Dr. K. at 2.30 P.M. by means of an injection of morphia. After the attack, as usual, there was extreme fatigue for twenty-four hours, followed, however, by a feeling of complete health."

"M., *July 30, 1885.*

"On departing from Carlsbad, May 21, I found my body-weight had still decreased by 10 lbs. I weighed 139 lbs., but was extremely well. However, the fits did not yet cease at home, but they limited themselves on the 4th, 9th, and 20th of June, to light chills and cramps in the legs. They were followed next day by red urine, which gave no pigment reaction. On June 21, at 11 P.M., a very violent attack came on, with pain in the epigastric region, continuous eructations, vomiting and rigors which did not cease till 2.30 A.M., and after two injections of morphia had been given."

"M., *August 1, 1885.*

"DEAREST COLLEAGUE,—In tendering you once again my best thanks for all the trouble you have taken with me, I beg to present the enclosed history of my illness, from which you will see that the Carlsbad treatment has met with great success, and that my recovery is now complete, &c.—Yours very faithfully and thankfully,

D. S."

"DEAREST COLLEAGUE,—First of all, my most hearty thanks for your affectionate lines. What you foretold me at Carlsbad, 'You will feel infinitely

better after a few months,' has been entirely fulfilled ; but, at the same time, an event has occurred which is more interesting, from a scientific point of view, than it is agreeable to me. With the general condition being good, and with the increase of weight by 10 lbs. during the last few weeks, sugar has again appeared in the urine after partaking of sugar and starchy food. This, however, does not much signify, as I have been in the same condition for more than eight years without much disadvantage. I do not expect you to print the history of my illness in full ; in several parts it is not sufficiently polished for the purpose. But, anyhow, please complete it with the following notes.

"(1.) I got fairly thin to the 27th year, and from that time my weight kept constant from 175 to 180 lbs., and I had a good deal of fat.

"(2.) Diabetes is not hereditary in my family, and came on with me as a consequence of great exertion and frequent enjoyment of sweets.

"(3.) In the beginning of 1883, after eating two cucumbers, I got an attack of diarrhœa, which lasted almost uninterruptedly for five months, although I dieted myself suitably, and used fitting remedies for it. In the evacuations which took place, without much pain, six to eight times in twenty-four hours,

I perceived no undigested food; and the diarrhoea had not much influence on general nutrition and strength.—Yours very truly, D. S.”

The history of this illness has been at my request composed (out of his carefully-kept diary), by my colleague, Dr. S. R. W., Med. Officer of M. He began it at Carlsbad, finished it at home, and sent it over to me with accompanying letters of 1st August 1885. I have reprinted this story at full length, with the remarks added by the author, and though some of these remarks may not be free from every objection, still, on the whole, it is very interesting and instructive, showing a different picture to that conveyed by No. 1, by its essentially different course and modified symptoms. In the second letter of 7th September 1885, what was said under No. 3 seems most important for our attention, for I am quite convinced that the intestinal catarrh which lasted five months, in this case, was the real cause of subsequent cholelithiasis.

III.—Cholelithiasis of Nine Years' Duration, with fairly Typical Symptoms, confirmed by accidentally finding Stones in the Evacuations.

As an accessory to No. 2, which was the history of a colleague's case, and penned by himself, the following account of an illness drawn up, by my request, by a layman, might be interesting. Patient was treated by me in 1880, 1881, and lastly 1885, at Carlsbad, and the case seemed to me, on account of its whole course, interesting enough to be published, especially as a lot of stones (some of them of bean size) had been rapidly evacuated one after the other without causing serious colic and without any jaundice.

Mr. H. had the first attacks (although not quite characteristic ones) in his 34th year; was very corpulent then, but quite well otherwise; had been a soldier for eight and a half years. Mother is said to have suffered in a similar way, though no gall-stones had been diagnosed in her case; father, brothers, and sisters healthy.

"In 1876 I had a pain in the right side (region of liver), which, the first time, disappeared after an hour's duration as suddenly as it had come, and left

no trouble behind. At first I did not much mind these symptoms, as, from my former health, I was led to believe they would soon spontaneously pass off. But therein I was greatly disappointed, for the pains returned, and each one occurred at a shorter interval and with greater intensity than the one before. Thus began the year 1879, and I now thought it time to take medical advice, which I had not done up to now, for I had put the pains down to flatulence, as I had always felt, when that occurred, a desire to eructate, which, if accomplished, indeed often relieved the pains. During such a condition the region over the liver became tense and so sensitive that I was obliged to unfasten my clothes; and there was an aching sensation of pressure on the right side of the abdomen, and the appetite was quite lost.

“The doctor whom I consulted said the liver was swollen; but still the remedies which were ordered had no lasting effect, for the condition became worse.

“In the winter of 1879–80 the attacks had resumed such an intensity that when any of them occurred I was quite unable to undertake the smallest occupation. Not only did the liver considerably increase with the onset of the fits, and so get very sensitive to the slightest touch, but spasmodic contractions of the stomach also occurred, and finally the whole

chest was contracted by the spasms. During such times I could do nothing but remain stretched out, for all movements were impossible. Features were disfigured, complexion sallow, and cold sweat appeared on the forehead. Then a feeling of pressure appeared on the right side of the abdomen, followed frequently by disagreeable eructations which sometimes lasted several days. Also in the lower part of the right side of the back I had an intense pain which was still more unpleasant than that in the liver region, and I always felt as though the rib was being bored by a blunt instrument. This pain often lasted several weeks, and only ceased for short intervals. With these fits a feeling of deep anxiety came over me, and no matter what position I occupied I could find no rest or relief from the pains. As the drugs and warm baths which had been ordered produced no improvement, and as I still continued to get much thinner, my physician urgently persuaded me to try the Carlsbad treatment. The medical certificate for the purpose of getting the required furlough only mentioned swelling of the liver. I arrived at Carlsbad towards the end of 1880, and applied to Dr. K., requesting his medical attendance, and communicated to him the opinion of the Breslau physician, that I was suffering from enlargement of the liver. After

Dr. K. had examined me, I was informed for the first time that I was suffering from gall-stones, and that the swelling of the liver was but a consequence of this disease, and the physician in question described the course of the pains from which I had hitherto suffered with great accuracy.

“The Marktbrunn, which was ordered, after a few days eased me from the sensation of pressure in the stomach, and improved my appetite very considerably. The second week I began Mühlbrunn, and after that, up to the end of the four weeks’ treatment, I began to drink Felsenquelle. On the whole, Dr. K. thought that a radical cure could scarcely be hoped for from one course of treatment, so I was advised to repeat it the next year, viz., 1881. Though I had lost 14 lbs. in weight (from 154 to 140 lbs.), I was still highly satisfied with the result obtained, for I returned home free from pain and in good spirits. After my arrival I went to the doctor who treated me there and told him Dr. K.’s diagnosis, but he did not agree. When a renewal of the symptoms occurred in the winter of 1880–1881, I sent for this same physician; but he again only treated me for swelling of the liver, although I repeatedly told him of the information I had obtained at Carlsbad. As I felt also great pains in the back, extending from the loin

to the shoulder-blade, I expressed a fear that I might be suffering from stone in the kidney, if not in the gall-bladder. After an examination the urine was also analysed, but with a negative result, no abnormalities being present.

“As no success was obtained, the Breslau doctor too, advised a repetition of the Carlsbad treatment. So in 1881, like the previous year, I asked Dr. K. to give me his medical assistance during a course of treatment which was to take place in the month of May; adding, that I had only been treated for a swelling of the liver and catarrh of the stomach at Breslau, which was all the medical certificate mentioned, no allusion being made to gall-stones. Dr. K. however, after examining my liver, fully adhered to his diagnosis of the previous year. This year, too (1881), the treatment was a great success, as I had no pain of any importance the whole of the following year (1882), and increased in weight on account of the large amount of food I took.

“When, in 1883, the same symptoms, only in a much smaller degree, returned, I consulted another physician at Breslau, whose attention I likewise called to the diagnosis made by Dr. K.; but he did not agree either, and I was treated again (as hitherto at Breslau) for swelling of the liver and gastric

catarrh. By permission of the doctor, I took (after trying several drugs) Marienbad Kreuzbrunn for about one and a half weeks; but as it only resulted in reducing my body-weight without relieving the pains, I took Mühlbrunn for another two and a half weeks.

“In consequence of the recurrence of attacks in the winter of 1883–1884, I was again advised to go to Carlsbad; but on account of its being less expensive, I managed to stay with some relatives in the country, and took the waters there. Until the end of January 1885 I remained almost entirely free from pain, and was much surprised at pains recurring at that time in the lower part of my back. The boring pains in the ribs, above described, also came on very acutely, followed by swelling of the liver, pressure in the region of the stomach, and loss of appetite. These pains so much increased in the course of a week that I could scarcely bear them. I was entirely bereft of sleep, and the weakness increased so much that I was obliged to go to bed. Appetite completely lost; tongue covered with white fur; and complexion pale, but not jaundiced. The physician who was called diagnosed great swelling of the liver and gastric catarrh, and tried to relieve the constipation, in which he was successful. But remission of the pain could not be obtained, though blood was withdrawn by

means of six cups applied to the right side of the back. On account of these great pains in the back, I again expressed the fear that renal trouble might exist; but examination both of the body and of the urine proved the contrary. Though I had taken no food for several days, there was always a tendency to vomit; and as I had learned from Dr. K. at Carlsbad that the passage of gall-stones causes such symptoms, I carefully examined my stools. The result was highly surprising and very important to me. At the first examination I at once found a hard stone-like body as large as a medium-sized bean. In the course of the day I found four other similar bodies, and sent them to the doctor, who said they were gall-stones. On the following visit, the doctor, however, said that he could by no means put down the malady to gall-stones, because there were no traces of jaundice. By continually examining the stools, I found within two weeks seventy-four stones, all the size of a bean except three. Dr. K. had therefore correctly recognised the nature of my complaint almost five years before, although there was no jaundice present. In order to entirely get rid of the disease, I again, on medical advice, went to Carlsbad.

“A. STEPHAN,
Railway Officer, Budest 24.

“CARLSBAD, *September 20, 1885.*”

IV. & V.—Cases of Cholelithiasis simulating Intermittent Fever.

Mrs. M. from C. came under my observation the 15th May 1889. She is 38 years old, of healthy family (a married sister is said to have suffered from gall stones); has had four children—all the labours normal; children healthy; has never lived in malarial districts. She had been quite well till the beginning of May 1888, when she had typhoid, which lasted so long that she did not entirely recover before the end of August of the same year.

At the beginning of March 1889 she fell ill one day with vomiting, and rigor, followed by a rise of temperature (40° C.), and afterwards great weakness. Every five days the attack returned, beginning usually at 4 P.M., with rigor lasting one to two hours, then a dry heat for twenty-four hours, and lastly one or two days of strong sweating.

From the beginning of the fifth week (but not every time), there was slight jaundice after the attacks, with itching, and more or less violent pains in the region of the liver. The disease was thought to be intermittent fever, and was treated as such by the family physician. Her husband being obliged to go (upon the advice of Professor K.) to Carlsbad, she

resolved to go with him, and, if possible, get treated there.

Beyond a very moderate enlargement of the liver, I could find nothing abnormal on examination; there was certainly no enlargement of the spleen. Patient had lost, within two months, ten kilos. in weight; complexion was greyish-yellow; appetite and sleep bad; great thirst; tendency to constipation; general disposition utterly depressed. There was no albumen or sugar in the urine, but plenty of bile pigment. My diagnosis was most decidedly that of "gall-stones." The second day after arrival was the so-called fever day; but, to the great surprise of the patient, a fit did not occur. Generally speaking, the first two weeks went on tolerably free from any decided fits, but there were some slight irregular feverish attacks of short duration. At the beginning of the third week the first violent, decided attack of biliary colic occurred, afterwards followed by severe icterus. A regular return of the fit occurred in five to six days, with lasting jaundice. Gall-stones were not looked for with sufficient care. During the seven weeks' treatment there was a further loss of weight; and soon after return home another severe attack came on, with slow recovery. Since October she has been quite well.

The case just mentioned, as well as that immediately following, are types of cases usually thought to be intermittent fever, which may deceive even experienced physicians, especially when only seeing such cases from time to time in consultation. In this case typhoid seems to have been the etiological factor; while in the following, bilious headache of long duration, and possibly also typhoid, seem to have been the causes.

Mrs. K., of Rh., aged 50, of healthy family; menstruation commenced at age of eleven. She is now in climacteric; is said to have always been well, except for frequent attacks of bilious vomiting, which her mother suffered from too. These bilious headaches occurred very often, especially after, but seldom with, menstruation. Married at 34; has never been pregnant, or suffered with her generative organs. In 1878 she got pains in the region of the right kidney, which came on in paroxysms; and the urine is said to have contained albumen (pyelitis calculosa?). She then went repeatedly to Carlsbad with great success. In August 1883 she was to have gone to Wildungen; but got typhoid, which lasted a long time, with slow recovery. Then for four years kept pretty well, increased in weight; but had, even during that time, slight rigors with subsequent heat

and sweat, without paying much attention to them. Since March 1888 these fits occurred more frequently and with a certain regularity, being brought on (according to her firm belief) by excitement caused by the death of the two German Emperors. At first, attacks came on every third day, then every second day, and finally they occurred every day. They were marked by pains in the liver-region and in the back, terrible itching of skin, no decided jaundice, and the urine was always dark after an attack. All the doctors in the neighbourhood were consulted by-and-by, and came unanimously to the diagnosis of "intermittent fever," and recommended antifebrile treatment; but all remedies proved useless, though antipyrin was given with success for a short time. Patient got worse and worse, and as a last resource, in October 1888 Professor E., of G., was consulted, whose diagnosis was that of cholelithiasis. He ordered complete rest, moderate use of Obersalzbrunn water, a corresponding diet, and as soon as patient had to some extent recovered, a long course of treatment at Carlsbad. After three months patient felt so much better and stronger that she ventured on a journey to B. In consequence of a tiring journey and much excitement, the attacks came on again; and although she had consequently

got into a very low state of health, she went, by the repeated advice of Professor E., to Carlsbad.

An examination of patient showed the following state:—Patient medium size, very thin, anæmic; conjunctiva yellowish colour; skin dry, pale yellow, with numerous effects of scratching dispersed over the whole body. Lungs and heart normal; heart-sounds weak; abdomen soft; liver moderately enlarged, and sensitive in the region of the gall-bladder; no splenic tumour; tongue furred; pulse quickened; urine scanty, dark brown, with a sediment containing no albumen and no sugar, but a small amount of bile pigment; appetite and sleep bad; bowels fairly regular. Patient was so weak that she could not leave her bed for some days after arrival, but was obliged to take small quantities of the mineral water while in bed. The attacks came on daily, beginning as a rule between 2 to 4 P.M., with a strong rigor of some hours' duration, followed by a dry heat; and it was only after midnight that sweating began, and with it some cessation of the pains. Towards morning she then slept from one to two hours. In order to give her a little more sleep, I gave her successively hydrate of chloral, paraldehyde, and sulphonal. The first two preparations were badly borne, and the last after a few days lost its efficacy; so that one evening when the rigor was

over I gave her an injection of morphia; the effect was very favourable, the condition of dry heat which usually lasted several hours was of very short duration. A slight sweat and a good sleep followed, and patient had the first good night she had experienced for a long time, and next day felt quite renovated. During the following days I gave her a small injection every evening, always with good effect, so that patient began to recover and to get some appetite. In the meantime patient called my attention to the fact that the rigors occurred later, were less violent, and did not last so long; the pains in the hepatic region and in the back became less; and there could be no doubt but that the morphia had exercised a favourable influence on the masked fits of colic. This suggested to me the idea as to whether the entire attack might not be prevented by an injection made about half an hour before the usual beginning of the rigor. The trial was made, and had the desired effect; and having continued the injections for several days, I missed a day, and at once the old symptoms appeared, although only in a moderate degree. I then continued the injections for a longer time, but missed one to two days after every three to four days. Patient got much better, could go regularly to the springs, drink three to four cups of Sprudel water, was in the garden during the day,

or took small walks. In a word, she went on so well that I was enabled entirely to leave off the morphia, and to consider treatment for the patient as finished (after duration of six weeks). Unfortunately she quite unexpectedly received some bad news from home, which excited her so much that the attacks returned with their former severity and regularity, the morphia not proving so successful as before. I must, however, add that owing to my fear that the patient might contract a habit of morphia I did not use it so freely and regularly this time. I did not think it necessary to continue the water-cure, knowing that she could stay but a few days more in Carlsbad, and that perfect rest, which is not to be obtained in the height of the season at Carlsbad, as well as good home-nursing, would afford the best prospect of cure. I consented to her plan of returning home, on the understanding she was to return for treatment late in the autumn. In the month of October she again came to Carlsbad, and told me that she had only slightly improved after her return, and for the first few weeks often had the customary attacks, and required also injections of morphia from time to time; but that since the end of August she had not had any attacks nor any liver pain, and had felt very well. Appetite and sleep were good, evacuations daily and free, increase of weight six

kilos. After three weeks' treatment passing without any disturbance, and during which she still gained two kilos., she left Carlsbad pleased and satisfied.

VI.—Cholelithiasis; Sudden Death in consequence of Intense Biliary Colic and Fatty Degeneration of the Heart.

Mr. T., from G., in England, aged 50, was in 1887 at Carlsbad, on account of intestinal complaints; and from what he told me of himself, and the description of his symptoms, I felt quite sure that he suffered from gall-stones, and wrote to his physician in England to that effect (he described his attacks in current language as "bilious attacks and indigestion").

Mr. T. had no return of the intestinal trouble after he left Carlsbad; but, on the other hand, he had at home repeated attacks of biliary colic, with subsequent jaundice.

On July 5, 1888, he came to Carlsbad again, and as the family physician pointed out in the accompanying letter, this time it was not so much on account of the intestine, as for gall-stones. During the third week of treatment he had a slight attack of colic, which, however, passed off without any intervention, and did not much alter his general

condition. The remainder of the treatment was undisturbed, so that his departure, fixed for the 2nd August, could have been carried out. Meanwhile, however, his wife contracted a bronchial catarrh, so that the departure was delayed. On 3rd August, at nine in the morning, Mr. T., who had gone out as well as usual, was suddenly taken with pains of a very acute and spasmodic nature, as described by him, but mitigated again by cognac and hot water. About 2 o'clock in the afternoon I was called in, as the pains had again increased in intensity, and patient was repeatedly obliged to vomit. An injection of morphia improved matters; and after half an hour, patient fell asleep, the vomiting ceased spontaneously, and at 9 P.M. the pain was steady but tolerable, no rise of temperature, pulse seventy-two.

4th August, 9 A.M.—Night had been restless, jaundice well marked, skin moist, tongue thickly furred, no appetite, mind perfectly clear, abdomen tense, and the pain in the hepatic region less than the day before.

One o'clock P.M.—No change.

Eight o'clock in the evening.—Pain again more violent, without any inclination to vomit; mental condition good; urine scanty, containing bile pigment;

no albumen. Morphia injection and glycerine enema administered.

Nine o'clock in the evening.—Pain less; patient feels a little better, but sleepy. During the night of 4th August, I was urgently summoned to come at once, and on my arrival death had already taken place. The body was embalmed in order to be taken to England, so that only the thorax and abdomen were opened.

Record of post-mortem examination:—Slight hypostatic congestion at the bases of both lungs; heart-muscle flabby, and pale yellow in colour; liver normal. Gall-bladder contained a large quantity of greenish-yellow gall, and thirty dark-brown faceted stones the size of beans. That part of the duodenum which borders on the liver was much injected; no peritonic adhesions, and in the lower third of the duodenum a large stone the size of a bean was found. Thus the cause of death, which was so unexpected, was not even satisfactorily accounted for by the post-mortem examination. In my opinion, death was due to the shock which resulted from the passage of the stone, especially as the heart was found in a condition of commencing fatty degeneration.

VII.—Gall-Stones for many years, complicated by
Intestinal Catarrh—Escape of a Large
Gall-Stone by Perforation from the
Bladder into the Intestine—Recovery.

Mrs. W., of London, aged 45, has suffered for many years with gastric (?) pains, which were declared by some physicians to be the result of a gastric ulcer, and by others to be of nervous origin, and so were treated without any success. In later years an intestinal catarrh also complicated her troubles, and in 1885 she was sent to Carlsbad. The precise description of the so-called gastric pains and their occurrence made me think *a priori* of the possibility of a gall-stone. Patient is said never to have had jaundice; but it is true, however, that her complexion has been of a pale-yellow tint, and has remained so without definite improvement. Appetite and sleep are mostly good, strength and spirits both perfect. On examining this much-emaciated lady, nothing abnormal was found in the thorax or abdomen, except in the region of the gall-bladder, where a pear-shaped tumour of medium size could be felt, which could be caught hold of and moved to the right and left, but not in an upward direction. Pressure on it quickly caused pain. I had not for long any doubt as to the

nature of the tumour; all possibilities being excluded, it could only be taken for the gall-bladder, which had become distended by one or several concretions; and that was the opinion I gave to the patient's husband, telling him that the stomach-aches and spasmodic attacks which the patient had undergone for many years could all be explained by gall-stones, but whether such gall-stones had already been evacuated could not be decided on the information available.

In my opinion, we had here to deal with a large stone, or possibly with several, which could scarcely pass off in the natural way, and so were unable to produce acute attacks of colic. I then pointed out expressly that if the stones ever escaped at all, they would probably do so by ulcerating through from the bladder into the intestine. After taking the waters for four weeks, the intestinal catarrh disappeared, and digestion became so improved that the lady gained in weight, and also got a better complexion. The winter passed tolerably well, and the patient was sent again to Carlsbad in 1886, but only because the intestinal catarrh returned from time to time, especially after colds. The tumour above-mentioned remained the same as regards size, but less movable and much more sensitive, so that patient could no longer bear the pressure of her corset. After being under treat-

ment for three weeks, which was quite sufficient to restore the intestine to normal action, patient went to Switzerland as an additional change, and then returned to England apparently well and strong. A repetition of the treatment had already been arranged for in 1887, but patient never came, and I received an explanation of her absence in a letter from her husband (dated London, 18th August 1887), an extract of which I give below :—

“My wife has been feeling ill since April of this year, and went in the beginning of June to the Northumberland hills for a change. For two or three weeks there she felt a little better; but one day she got violent abdominal pains which came on quite suddenly, and at the same time biliary vomiting occurred every fifteen to twenty minutes. This condition lasted several hours, and ended in complete collapse. Strong stimulants were used at short intervals, but it was eight to nine hours before recovery took place. Diet consisted of milk and mineral waters, and every four hours stimulants were given as well. Gradually regained strength, but was in bed quite fourteen days. After this time she one day felt a violent desire to go to stool, but all her efforts to defæcate were in vain. Strong enemias met with no success; and so the doctor re-

solved to crush, by means of an instrument, the hard palpable masses present in the lower part of the rectum, and then to get rid of them by washing. At last, under violent pain and great difficulties, a hard round mass was removed by forceps, which proved to be a gall-stone weighing 150 grains. From that time a rapid recovery took place, looks better, complexion clearer, and intestinal action is quite regular."

In 1889 the lady came to Carlsbad again, as she said for the sake of precaution, but in reality on account of a painful sensation which she had in the hepatic region, and fear she had that the gall-stone trouble would recur. The lady, formerly so thin, had become quite strong, and had nothing to complain of but a certain painful sensation and feeling of tension on the right side (hepatic region), which occurred from time to time. Examination showed a moderate enlargement of the liver, especially the left lobe, and great hyperæsthesia in the region of the gall-bladder. The tumour had disappeared, and the gall-bladder could not be felt. When treatment was first begun, the lady had repeated bile-stained, tar-like evacuations, which were generally preceded by slight spasmodic pains; but by the second week the action of the bowels had become normal, the swelling of the liver had decreased, and the general condition was (and, as far as I know, still is) very good.

VIII.—Long-continued Migraine—Gall-Stones— Recovery.

Mr. M., retired officer and landed proprietor in East Prussia, consulted me in 1883.

Patient, aged 42, suffered from migraine and frequent bilious attacks for many years, but was never seriously ill otherwise. His mother had also suffered a great deal from migraine, and had died from an affection of the liver. He had been unfortunate in the number of deaths which had occurred in his family, and in consequence suffered from nervousness and want of sleep. During the preceding year he had suffered repeatedly from attacks of colic, which had been referred to gall-stones, and such stones had actually been found in the evacuations.

There was nothing wrong with the stomach, digestion was slow, and evacuation was only obtained by the use of enemas. Urine: no albumen and no sugar, but microscopically crystals of oxalate of lime were found in moderate quantities. Patient was well built, but had evidently become thinner the last year (fifteen kilos. of weight lost). Beyond slight swelling of the liver, and increased sensibility to pressure in the region of the gall-bladder, nothing abnormal could be found. The

six weeks' treatment which was ordered did the patient a great deal of good, and he finished with an increase in weight of three kilos. To complete the cure, sea-baths at Kranz were taken.

In 1884 Mr. M. came here again, without any special reason, as he said, but merely because I had advised a repetition of last year's treatment. He had remained free from migraine and colic, and had in the course of the year increased his weight by another nine kilos.

IX.—Adipose—Catarrh of Stomach and Intestines —Gout—Biliary Gravel.

Mr. S., provision merchant of Dresden, aged 29, a bachelor, consulted me, for the first time, in May 1883. I had treated the mother of this gentleman (also a very corpulent lady) for cholelithiasis, in 1875 and 1876, and lastly in 1879; and as patient had repeatedly, during the last year, suffered with attacks like those his mother used to have, he came by her advice to Carlsbad without consulting a doctor.

Patient was of medium build, but very corpulent; had a very good appetite, and, as he thought, a good digestion too, as he had three to four liquid evacuations

every day. He lived very freely, and without sufficient exercise. Complained of a continuous sense of pressure and tension in the region of the stomach and on both sides of it; also that collections of mucus caused retching, and bilious matter was frequently brought up, especially in the mornings; had heartburn and frequent eructations; and sometimes, especially after a large supper (although not immediately after), the sensation of pressure changed into an intense sickening pain, which began on the right side, under the ribs, and then spread over the abdomen and thorax, hindering respiration, and only gradually ceasing after much vomiting had taken place. Patient then felt very poorly for one to two days, but soon recovered quite perfectly, until another attack appeared with the same consequences. These fits, which at first occurred so rarely that they were scarcely paid attention to, soon became more frequent and more intense; but were never followed by jaundice, except that the eye was transitorily coloured yellow, and the urine became dark brown.

From time to time the patient also suffered with gout (the first time five years previously), and the urine, which was usually straw-coloured, now and then deposited a brick-dust sediment.

On examination, I found all the organs in very

good condition; the lungs were normal; cardiac dulness somewhat increased with weak but clear heart sounds. Examination of the abdomen did not give me any precise idea as to the size of the liver, on account of the large amount of fat, and also on account of the general abdominal pain, which even moderate pressure gave, especially in the region of the liver and along the colon transversum. Urine, sp. gr. 1030, very acid, reduced copper oxide slightly, no albumen.

Rigorous diet, plenty of exercise in the open air, with a combination of the "water-cure" and the "bath-cure," met with great success, and much improved the general condition of the patient. From the fifth day the stools became more normal in consistency and darker in colour, and the dyspeptic symptoms gradually disappeared. On the eighth day a lot of dark, hard, sandy little grains were mixed with the stool, which were easily proved to contain biliary pigment; but for the next few days the evacuation of sand was very small, and the stools were normal. During the night following the fourteenth day of treatment, patient had an attack of colic for two hours, and of such violence that I was obliged to inject morphia. Next morning the urine was very dark, and contained abundance of

biliary pigment; both conjunctivæ were distinctly yellow; the appetite was lost, and there was great weakness. Defæcation, which did not occur for two days, took place on the third day after the fit, but only after large doses of castor-oil, and the stool contained several table-spoonfuls of biliary gravel, but coarser-grained than that formerly evacuated. After four weeks' treatment, twelve kilos. had been lost in weight, and I sent the patient to Saxon Switzerland, to complete the cure; but ordered the strict diet to be continued, and advised him to repeat the Carlsbad treatment the next year.

Mr. S. came to Carlsbad again in September 1884, in order, as he said, to get rid of some of his superfluous fat. During his after-treatment he had lost six more kilos. of weight, but later on had gradually put on ten kilos. Since leaving Carlsbad he had had no attacks of colic and no gouty manifestations. Three weeks' treatment this time was sufficient to reduce his weight eight kilos., and his condition was highly satisfactory in every respect.

X.—Cholelithiasis—Slight Symptoms of Diabetes —Evacuation of Stones larger than Hazel-Nuts.

Baroness v. R., of Curland, aged 42, has suffered since the birth of her second child (now a young lady

of twenty) with spasms of the stomach, according to the opinion of doctors both at home and at St. Petersburg. These spasms sometimes occurred (very often during last few years) after supposed errors in diet, and sometimes after mental emotions, and, as a rule, could only be relieved by morphia. She was advised by her physicians to go to Franzensbad; but upon the urgent advice of another physician, who diagnosed her malady as gall-stones, she came to Carlsbad, and consulted me for the first time on July 12, 1887.

History.—Father, aged 72, healthy. Mother died in childbed, aged 36. One brother, an officer, healthy. Sister, aged 38, married, and suffers similarly with her stomach. Patient, when a girl, was quite healthy and rather stout, but has always, as far as she recollects, suffered from constipation. Married at 18, and has had two miscarriages and two normal deliveries. Has never had jaundice, not even for a short time, after her attacks; but, at the same time, she and also the people about her were struck by the grey complexion she had gradually developed in the course of the last few years. She also told me, what she had never mentioned to any one before, that she has had for the last six months an intense itching of the external genital organs, which, though tolerable during the day, gets so bad at night that sleep is

prevented. My questions as to increase of thirst and frequent micturition were both answered in the affirmative, so that I could from these symptoms judge pretty certainly what an examination of the urine would be likely to show; and, strange to say, up to this time no examination of urine had ever been made. Upon examination, I found patient rather emaciated, with the skin of a sallow-grey colour; heart and lungs normal; liver not enlarged; but the fundus of the gall-bladder projected about a finger's-breadth beyond the margin, and I could distinctly feel a solid body in the gall-bladder whenever I palpated deeply. I repeated the examination under chloroform, and convinced myself of the correctness of my first opinion. Urine acid, amber colour, sp. gr. 1032, sugar 2·8 per cent., no albumen. Patient was put on an exclusively meat diet, and was given a daily injection of two litres of Mühlbrunn; and for the pruritus vulvæ, carbolic oil was applied.

The urine passed during the night of the third day was examined on the 16th July; the quantity was 800 grammes, sp. gr. 1018, no albumen, but slight traces of sugar. Now I made patient begin the water-cure, and continued the injections as well; the usual anti-diabetic diet was being taken, with 60 grammes of Graham bread *pro die*. On the 21st July, in the

evening, patient got (in consequence of drinking cold Giesshubel water, as she said) sudden pains in the stomach, which soon became spasmodic, but disappeared at once after a morphia injection, which she had brought from home; the whole attack had lasted about an hour. On the 22nd July there was no evacuation in spite of an injection, appetite small, but no pains in the stomach.

The following night I was called at 2 o'clock, after the poor woman had already suffered intense pain for two hours, and had repeatedly vomited. A morphine injection quieted her, but only for a time; and it was only 5 o'clock when she again woke with intense pains, and this time they were even more acute than before, and I was asked to come as soon as possible; the patient was almost raving, and could not be kept in bed; the skin was dry and hot, and the forehead covered with a cold sweat; pulse 120; temperature could not be taken, owing to patient's restlessness; no rigors. With some doubt I gave an injection of morphia again (the third within six hours), whereupon the pains got a little less, so that the patient could at least keep quiet. I ordered an ice-bag over the liver, and prescribed ether internally. At 10 o'clock in the morning (July 23) I saw her again, and what struck me first was the commencing jaundice

which in this case had begun not quite twelve hours after the beginning of the fit. I found patient quieter; temperature 38·2 C.; pulse 100; pains still continued, but were more tolerable, and, in the opinion of the patient, were not so "tearing and spasmodic" as before. The ice-bag, being too heavy, was changed to ice-compresses, and the ether continued.

At 6 P.M. patient had slept several hours, and was essentially better; temperature 37·6; pulse 84; pains moderate as long as she kept quiet, but immediately worse on change of position; jaundice typical, and urine dark brown.

July 24, 9 A.M. Night altogether was fairly quiet; slept a little; but the dull pains were still continuous, and grew more violent from time to time, spreading from the hepatic region towards the umbilicus. Patient had also had some acute pains in the right side of the back and shoulder, with nausea. There was intense jaundice and itching of skin, and the thirst had also been greater since the beginning of the attack, although the pruritus vulvæ had almost disappeared, and no sugar was to be found in the urine. Prescribed — ice to suck, lukewarm enema (camilla infusion and olive oil), and liquid diet. Six o'clock P.M.—general condition better, pains moderate, enema had not been successful.

July 25, 9 o'clock A.M. Patient had slept pretty well, temperature and pulse normal, icterus unchanged, pains less, and appetite a little better. Prescribed one glass of Mühlbrunn, with a tea-spoonful of Carlsbad salt. I did not think an evening visit any longer necessary, but at 2 A.M. I was called to the patient, who had got a violent attack again. At 10 o'clock that evening she had had a free evacuation in consequence of the salt, and soon after that the spasmodic pains and vomiting came on. I found patient very much exhausted by the fit which had already lasted more than three hours, and I was considering whether I should risk another injection of morphia or do something else, when patient sank back swooning. It took a good hour before she recovered enough for me to safely leave her for any length of time, and before going, I ordered complete rest, ice compresses over the liver, and frequent doses of cognac. Four hours later I found the patient fairly recovered, and all the explanation she could give was that in the midst of the pains she suddenly felt as if something would have torn in her interior. She knew absolutely nothing of the time she was swooning or of the means that were used to resuscitate her. To me, the whole proceeding, though somewhat alarming, meant that a large stone had forced a passage from the common duct into the

intestine; and therefore the patient was told to have all evacuations carefully examined, and to make them pass through a hair sieve. Of course patient was still much affected, the pains were still considerable, and there was also a sore burning feeling over a spot which probably corresponded with the intestinal portion of the common duct. In the evening patient had a slight chill followed by a rise of temperature (38.6°) and an increase in the pulse-rate; but at 10 P.M., when I saw her again, she was a little better.

July 27, 9 A.M. Patient fairly well; had eight hours uninterrupted sleep (one gramme sulphonal acting as the best medicine). Pains and complete want of appetite were the same as the day before. Ice compresses continued; and internally, Potio Riveri, and cognac with the yolk of an egg. In the evening there was a repetition of the fever symptoms of the day before, but in slighter degree; the pains continued; jaundice unchanged; liver considerably swollen and very sensitive.

July 28. Night not so good; more pains, and more definite in character; great faintness. An enema consisting of a litre of Mühlbrunn with a table-spoonful of Carlsbad salt, was given, but met with little success, as, beyond water, only a few small clay-like lumps returned, accompanied, however, by a good deal of

wind. After this there was some improvement; there were no fever symptoms in the evening, but the pains continued.

July 29. Patient very weak but almost entirely free from pain. During the night there was a similar attack to those which occurred on the nights of the 25th and 26th July, although less violent. From 11 P.M. to 1 A.M. violent paroxysms with vomiting came on, and just as patient was going to send for me, I was afterwards told that the pain suddenly ceased. From this time recovery went on surely though slowly.

On July 30, in the morning, I made patient take a table-spoonful of castor oil, and three hours after she had a copious evacuation, wherein a gall-stone larger than a hazel-nut and of cubical shape was found. From the shape of this concretion, as well as from observation of the whole course of the illness, I saw that I was wrong in supposing there was only one large stone, but that originally there were at least two, if not more, in the bladder. On 30th July and the 1st August there was no evacuation, although patient every day took a glass of Mühlbrunn with the addition of Carlsbad salts. She was visibly recovering, and only complained of a slight aching sensation to the left of, and above, the umbilicus.

On 2nd August, after castor oil, there was a copious bile-stained evacuation, in which another large gall-stone similar in shape to the first one, and two smaller ones larger than peas and of tetrahedral shape, were found. Icterus less marked; nocturnal urine still very dark; but that during the day was lighter, with a large quantity of urates.

On the 3rd of August she left her bed, and the bowels acted spontaneously every day, and up to the 5th August four more small stones were found. On 6th August she was again able to go to the springs, and the remainder of the course, which altogether extended over eight weeks, proceeded without interruption. Jaundice had entirely disappeared, and towards the end of August the urine remained free from sugar. Patient still remained three weeks at Schandau to complete the recovery. In June 1888 patient again came to Carlsbad, because her urine was stated to contain sugar. She had felt so well for months that she had gradually changed the strict diet which was ordered into a mixed one, and bad consequences naturally occurred. On the other hand, digestion remained excellent, and she never had any return of the so-called stomach-aches. After eight days' treatment the urine again became free from sugar, and after a course of three weeks I could dis-

charge her, but not without urgently recommending her to continue the strict diet ordered. This case, highly interesting in many respects, is, above all, a typical picture of the different phases of cholelithiasis with, as it were, a normal termination, *i.e.*:—

(1.) Periodical pains and spasms of the stomach as forecasts and results of biliary colic, with which gravel and small stones have possibly passed off unnoticed, and without causing any jaundice properly so-called. Still it is possible that stones may have only got to the neck of the bladder and then caused slight attacks, and fallen back into the bladder again.

(2.) After eight days of the water-cure at Carlsbad and daily irrigation of the intestine, the vigorous peristalsis thus induced, caused the sudden onset of intense colic and gradual movement of large stones into the ductus communis.

(3.) Complete obstruction of the duct, with consequent jaundice.

(4.) After three days' acute pain the first stone passed, probably not without injuring the ostium duodenale of the ductus communis; and collapse took place in consequence of shock.

(5.) Continuation of pains and jaundice on account of the complete closure of the ductus communis by a second stone passing off three days later, but in a

much easier way than the first; and this was again followed by several smaller concretions.

(6.) Perfect recovery.

Whether there was in this case any hereditary predisposition could not be stated, but it seems possible, considering the sister of this patient is said to have suffered from the same complaint. The other etiological factors seem to me an inclination to constipation (since childhood) and abuse of drastics.

XI.—Renal Calculi—Gall-Stones and Diabetes.

A commercial councillor, R. of A., consulted me for the first time in 1881, when he came to Carlsbad on account of renal calculi, which, when they escaped, caused violent colic and blood in the urine.

Patient, a well-fed gentleman, with a complexion of a decided yellowish-brown tint, also complained of an aching pressure in the region of the stomach and liver, especially two to three hours after meals, and of marked mental depression. Nothing abnormal was found in the urine except occasionally small deposits which sometimes reached a hemp-grain in size. The liver was considerably enlarged, especially the left lobe, and very sensitive to pressure. The region of the gall-bladder was also very sensitive, and on

pressure patient felt, besides an acute and pricking pain, also nausea, and an inclination to vomit. Without being able to state with any certainty that gallstones existed, I bore the possibility in mind; but the course of treatment did not justify my suspicions, as it passed without any interruption, and not even the slightest renal colic occurred.

Liver decreased in size, the symptoms caused by it disappeared, and the complexion got strikingly lighter. The following winter passed fairly well, but moderate attacks of renal colic now and then came on, but so slight as not to cause blood in the urine; but still for this reason patient again came to Carlsbad in May 1882. The liver and complexion were in much the same condition as the year before; but three weeks' treatment was sufficient to reduce the liver in size, to improve the digestion, and generally to make his whole condition better. In the spring of 1883 patient came again to Carlsbad, and showed me a box of gallstones which ranged from the size of a hemp-seed to the size of a pea. These had been evacuated during the winter, partly with and partly without subsequent jaundice. Small stones were also found in the urine from time to time, without any great pain being caused by their evacuation. I made the patient (though he was somewhat reduced) undergo an ener-

getic treatment for four weeks, which did him so much good that, to use his own words, he was bodily and mentally healthier than he had been for many years. Let me expressly state that I had carefully and repeatedly examined his urine without finding either albumen or sugar. I was thus all the more surprised when patient returned in 1884 and told me that his family physician said there had been sugar in his urine during the latter part of the winter, which was also confirmed by another colleague's report. For the patient (who, by the way, was highly educated, and accustomed to take good care of himself) was struck by increasing thirst and by frequent micturition, but still more by his noticing himself getting thinner, and losing strength every day. He consulted his physician, who immediately analysed his urine, and found that sugar was present in a quantity of more than 1 per cent. Under suitable diet, sugar disappeared to a mere trace; but when patient came here he had not been keeping a strict diet, and he had 0·8 per cent. sugar, with comparatively few diabetic symptoms. It is true that he looked much thinner than in previous years; but, on the other hand, there was no enlargement or increased sensibility of the liver, nor had he suffered from biliary or renal colic during the whole year.

Patient remained three weeks at Carlsbad; after the first two weeks the sugar had entirely disappeared, and when he went away his weight had increased by three kilos. Since then he has always been free from sugar for some months after a treatment at Carlsbad, which he undergoes annually, as well as keeping to a moderately limited diet. During winter the diet is usually less rigorously adhered to, and then he usually comes to Carlsbad in May with 1 to 1½ per cent. of sugar in the urine.

He has not had any more gall-stones, and he has had no renal colic for the last few years, though gravel still passes off from time to time.

XII.—Cholelithiasis—Evacuation of Stones ten hours after the beginning of the Colic—First Icteric Symptoms thirty-six hours later.

“In the winter 1884–1885 the first symptoms of biliary colic appeared. At first the attacks came on at long intervals of three to four months, but later they occurred regularly almost every six weeks. My skin was first coloured yellow some years before, after a similar attack, which lasted several days, and while in that state, in spite of weakness, I went by order

to buy horses in Eastern Prussia, where a regular diet was absolutely impossible.

“During that time I had no symptoms of the disease; and after the time of my command had expired, I returned to Cassel, and there after six weeks I again observed symptoms of biliary colic, which, however, only lasted a short time. For two and a half years I have been at Hofgeismar in Hessa, where both well and stream waters are very chalky, and it is a noteworthy fact that the attacks have become augmented here so much that they were repeated every three to four weeks.

“Towards the end of March I was again attacked with colic followed by jaundice. The first pains I felt occurred from 6 to 7 A.M.; but, all the same, that very evening I found in the stool a small brown stone about the size of a lentil or pea, triangular in shape, of a soapy quality, and containing a distinct nucleus when cut open. Their number increased with each defæcation, so that in all forty stones were found. The next evening the first signs of yellow-coloured complexion appeared.

“ B——

*Veterinary-surgeon in the dragoon
regiment, Manteuffel.*

“CARLSBAD, June 7, 1889.”

The history of this patient's illness was given me, with permission to publish it, by himself on the day of his departure (8th June 1889). He consulted me only twice, but his case shows some interesting points:—

(1.) Three years' duration of the disease without jaundice, then an acute attack followed by typical icterus.

(2.) Directly after this attack, and while its effects were still lasting, a long journey, with professional activity for three months, had to be undertaken, with no chance of regular dieting, and still the general condition kept good.

(3.) The observation that the attacks occurred more frequently and more violently while drinking and using chalky water.

(4.) After the attack at the end of March 1889 (the duration and intensity of which we have no data), evacuation of stones began in ten to twelve hours after the beginning of the attack, while jaundice did not appear till thirty-six hours afterwards.

According to the information which patient gave me personally, he takes at the beginning of each fit one gramme of antipyrin every hour, in all three to four grammes, and he believes he gets relief from it.

XIII.—Gall-Stone Conglomeration perforating from the Gall-Bladder into the Colon, and passing “per Anum,” without alteration of the Patient’s general condition.¹

Frau v. W., a well-preserved, stout-looking lady of 60, has been twice (1887 and 1889) in Carlsbad and under my care for gall-stones; has always enjoyed good health; was married—one child—a son, strong and healthy. She has, as far back as she can remember, suffered from constipation. Since 1882 she often had attacks of pains and spasms in the region of the stomach, which were said to be due to gastralgia. These attacks were accompanied by sickness and nausea, but until the last few years not followed by jaundice.

In 1887—the sixth year after the beginning of her present illness—these attacks came on more frequently and with a certain regularity, lasted longer, were very painful, and followed by jaundice, the latter again disappearing after a few days. Then, of course, the correct diagnosis of gall-stone was made, and the evacuations were carefully examined. In fact, after a renewed severe attack, four faceted stones were

¹ *Prag. Med. Wochenschrift*, 1891. No. 11. .

found in the stools, one of them being larger than a hazel-nut.

In August 1887 she was sent to Carlsbad ; had no attack there ; and though she did not, as I advised her, return the following year, she felt perfectly well until the beginning of 1889. At that time the former attacks began again, some milder, some more severe, until July of the same year, when she had a very severe attack followed by jaundice. She gradually got better, and in August (1889) she was strong enough to go again to Carlsbad.

On examination, I made out in the region of the gall-bladder a pretty large, slightly movable tumour, which I considered, according to its position and condition, and the history of the case, and after excluding other possibilities, to be the gall-bladder, distended by biliary concretions.

During her whole course of Carlsbad treatment she complained of more or less tenderness *caused* by that tumour, but kept free from attacks of biliary colic.

After returning home she had up to Christmas (for about three months) constant but not spasmodic pains in the lower region of the liver, especially when going upstairs, or bending down, or altering her position in bed during the night ; otherwise no disturbance of her general condition ; no fever.

After Christmas 1889 till April 1890 she was free from pain, her general condition being excellent; and what should be particularly mentioned, her bowels acted regularly and spontaneously all the time until about middle of April, when she suddenly became again constipated, and was ordered to Carlsbad.

She arrived on the 25th of April (1890). On examination I did not find anything abnormal except a moderate distension and tenderness of the whole abdomen; the above-mentioned tumour I could not find any more.

During the first fortnight of her course there was very little defæcation, though she took plenty of Carlsbad waters and other purgatives besides; and the condition of the patient, who was apparently so well when she arrived, got gradually worse and rather alarming, showing already symptoms of intestinal obstruction of a very serious nature.

On 9th May she passed some flatus, and declared she felt like having an action of the bowels, but several attempts made during that day had no effect. During the following night she tried again and again, and it seemed to her that there must be something in the lower part of the rectum, which with all the straining and pressing she could not get rid of. Then she tried to remove the obstacle with her fingers, and felt

distinctly a hard lump, which did not allow the finger to pass through the anus; however, by continual endeavour she succeeded in breaking off single pieces, and at last, by pressing hard, she passed the whole lump, which, when falling to the bottom of the night-stool, caused an audible clicking sound. Then followed a very large evacuation, and the patient naturally felt great relief.

Having previously passed some gall-stones, the clicking of the hard lump brought by itself to her mind the idea that she had possibly passed a large gall-stone, and she consequently ordered the next morning that the whole evacuation should be passed through a sieve, and the result was as interesting as surprising: besides some single-faceted stones, a large cone-shaped conglomeration, and the two larger pieces probably broken off from the base of the cone, were found, the single stones apparently having fallen off from the sides and the top of the cone, there having originally been only *one* large conglomeration which *in toto* had the appearance of a cone, which was, in fact, a mere cast of the distended gall-bladder. It was not very difficult to fit the broken-off pieces and the single stones to the larger mass so as to get the genuine whole cone, its height being about 6 centimetres, the diameter of the base $4\frac{1}{2}$ centimetres.

Such a big lump could, of course, not get otherwise into the colon but by direct perforation from the gall-bladder after an adhesion which, in consequence of a previous though latent inflammatory condition, had taken place between the fundus of the gall-bladder and the corresponding part of the colon.

By recapitulating the course of the whole process, we find that after the last colic in July 1889 there existed constant pain—yet without any spasmodic or paroxysmal character—in the region of the gall-bladder, which was increased by any violent movement, like bending downwards, climbing stairs, or turning over when in bed, and so on.

These pains, not accompanied by fever or peritoneal irritation, did not alter in the least the general condition of the patient, nor prevent her from performing her duties as the lady of the house. Further on, these pains lasted until Christmas 1889, and were the only symptoms of the gradual adhesion of the gall-bladder to the colon, and the beginning of the perforation caused by necrosis through pressure.

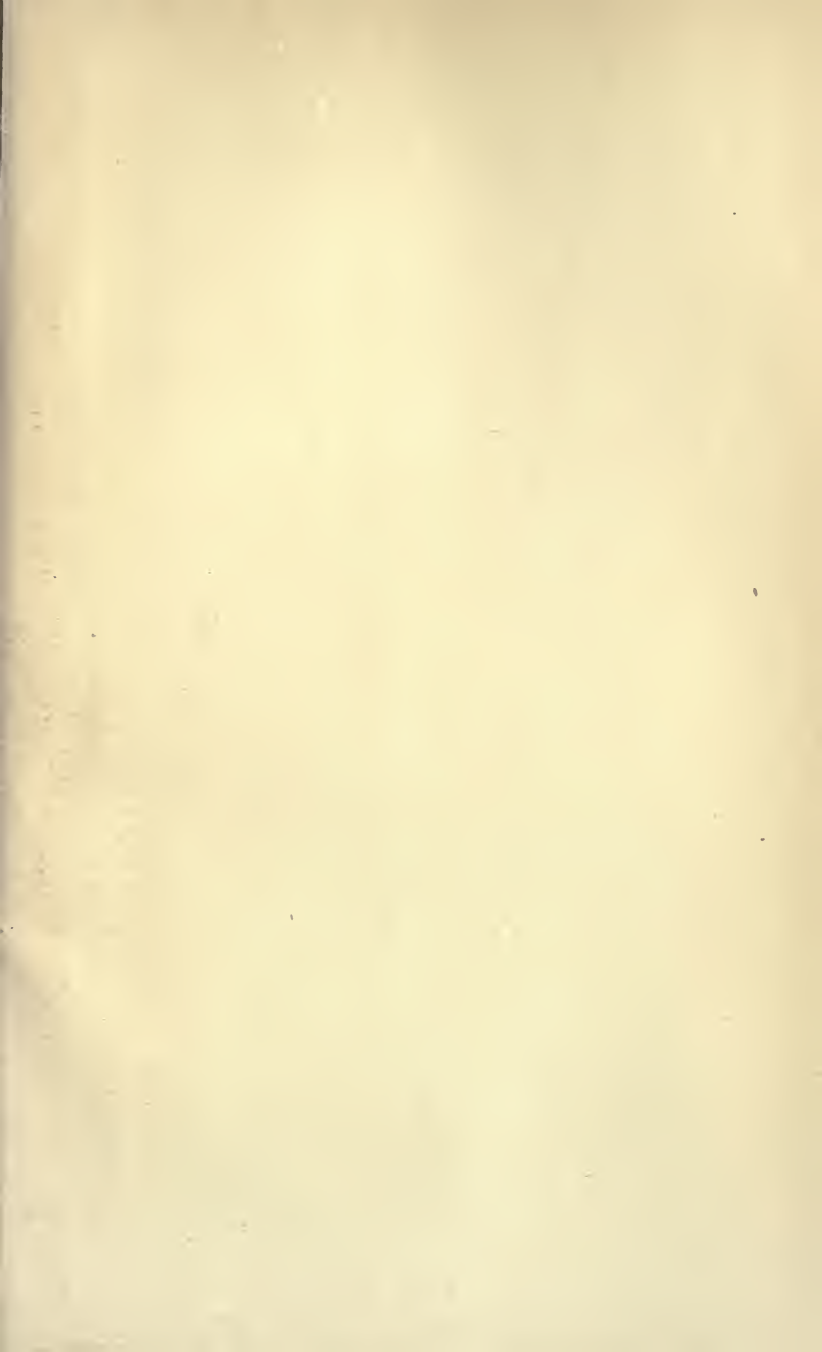
It took fully four months—during which time the patient felt fairly well, and had daily spontaneous evacuations—until the fistula between gall-bladder and colon had got large enough so that the whole contents of the former, *i.e.*, the conglomeration, could get

into the latter, where they caused symptoms of complete intestinal obstruction ; and that accounts for the long time (three weeks) the conglomeration required to pass the relatively short distance through the transverse and descending parts of the colon, the sigmoid flexure, and the rectum, until it reached the anus, whence it was finally evacuated by a kind of labour-pain, and only then after some pieces had been previously broken off by hand.

Merely owing to the circumstance that I had advised her to use the night-stool, and that she heard the clicking of a hard body on the bottom of the porcelain vessel, and consequently ordered that the stool was to be carefully examined, it was due that, by finding the conglomeration, the whole process was properly explained, and also the reason for the disappearance of the previously diagnosed tumour was given.

As far as I know, no similar case has been hitherto published, and rare as such cases may be, even the one proves that even a most critical case may, under favourable circumstances, take an unexpected good turn.

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Kraus, J.
Gall stones

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